MUSK-OX, BISON, SHEEP & GOAT

By

CASPAR WHITNEY

and others

AMERICAN SPORTSMAN'S LIBRARY

Edited by Caspar Whitney

AGRICULTURAL
THE LIBRARY
OF
THE UNIVERSITY
OF CALIFORNIA
RIVERSIDE

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/muskoxbisonsheep00whitiala

THE AMERICAN SPORTSMAN'S LIBRARY

EDITED BY

CASPAR WHITNEY

MUSK-OX, BISON, SHEEP AND GOAT

The
Co.

LOC 961.934

MUSK-OX, BISON, SHEEP AND GOAT

BY

CASPAR WHITNEY
GEORGE BIRD GRINNELL
AND
OWEN WISTER

NEW YORK
THE MACMILLAN COMPANY
LONDON: MACMILLAN & CO., LTD.
1904

THE BEGINNING OF THE SLAUGHTER

THE BEGINNING OF THE SLAUGHTER

ID# 906234

MUSK-OX, BISON, SHEEP AND GOAT

BY

CASPAR WHITNEY
GEORGE BIRD GRINNELL
AND
OWEN WISTER

New York
THE MACMILLAN COMPANY
LONDON: MACMILLAN & CO., LTD.
1904

All rights reserved

SK41
W45

Copyright, 1904,
By THE MACMILLAN COMPANY.

Set up, electrotyped, and published February, 1904.

Norwood Press
J. S. Cushing & Co. — Berwick & Smith Co.
Norwood, Mass., U.S.A.

MUSK-OX, BISON, SHEEP AND GOAT

CONTENTS

THE MUSK-OX

By Caspar Whitney

CHAPTER		PAGE
I.	My First Kill	17
II.	The Provision Question	32
III.	Seasons and Equipment	44
IV.	Method of Hunting	56
V.	The Musk-ox	70

THE BISON. By George Bird Grinnell . . 107

THE MOUNTAIN SHEEP: HIS WAYS. By Owen Wister 167

THE WHITE GOAT AND HIS WAYS. By Owen Wister 227

INDEX 277

ILLUSTRATIONS

THE BEGINNING OF THE SLAUGHTER . . . *Frontispiece*

PAGE

IN THE FAR NORTH 15

AT BAY 30

OUTNUMBERED 45

EAST GREENLAND MUSK-OX CALF 57

HEAD OF TWO-YEAR-OLD MUSK-OX BULL 57

MUSK-OXEN ON CAPE MORRIS JESUP, BROUGHT TO BAY BY DOGS 65

THE AUTHOR'S BARREN GROUND HUNTING KNIFE AND AX 67

THE BARREN GROUND MUSK-OX — A FULL-GROWN BULL . 71

FOREFOOT OF BARREN GROUND MUSK-OX 76

FULL-GROWN EAST GREENLAND MUSK-OX — ADULT MALE 77

FOREFOOT OF EAST GREENLAND MUSK-OX 79

SKULL OF THE EAST GREENLAND MUSK-OX — FRONT VIEW 82

SKULL OF THE BARREN GROUND MUSK-OX — FRONT VIEW 82

SKULL OF THE EAST GREENLAND MUSK-OX — SIDE VIEW . 83

SKULL OF THE BARREN GROUND MUSK-OX — SIDE VIEW . 83

MALE YEARLING OF THE EAST GREENLAND MUSK-OX . 87

ADULT FEMALE OF THE EAST GREENLAND MUSK-OX . 95

MUSK-OX CALF 101

THE LAST OF THE HERD 109

PAGE

PROTECTED 139

ROCKY MOUNTAIN SHEEP 169

ALERT 177

UNDER A HOT SKY 187

SURPRISED 201

THE SADDLEBACK SHEEP 213

ABOVE TIMBER LINE 229

THE WHITE GOAT IS AN AGILE CLIMBER 253

THE MUSK-OX AND ITS HUNTING

By Caspar Whitney

IN THE FAR NORTH

MUSK-OX, BISON, SHEEP, AND GOAT

THE MUSK-OX

I

My First Kill

We had passed through the "Land of Little Sticks," as the Indians so appropriately call that desolate waste which connects the edge of timber land with the Barren Grounds, and had been for several days making our way north on the lookout for any living thing that would provide us with a mouthful of food.

We had got into one of those pieces of this great barren area, which, broken by rocky ridges, of no great height but of frequent occurrence, are unspeakably harassing to the travelling snow-shoer. It was the third twelve hours of our fast, save for tea and the pipe, and all day we had been dragging ourselves wearily up one ridge and down another in the ever recurring and

always disappointed hope that on each we should sight caribou or musk-oxen. The Indians were discouraged and sullen, as they usually did become on such occasions; and this troubled me really more than not finding food, for I was in constant dread of their growing disheartened and turning back to the woods. That was the possibility which, since the very starting day, had at all times and most seriously menaced the success of my venture; because we were pushing on in the early part of March, at a time when the storms are at their greatest severity, and when none had ever before ventured into the Barren Grounds. Therefore, in my fear lest the Indians turn back, I sought to make light of our difficulties by breaking into song when we stopped to "spell"[1] our dogs, hoping by my assumed lightheartedness to shame the Indians out of showing their desire to turn homeward.

How much I felt like singing may be imagined.

So the day dragged on without sight of a moving creature, not even a fox, and it was past noon when we laboriously worked our way up one particular ridge which seemed to have an unusual amount of unnecessary and ragged rock strewn

[1] Rest.

over its surface. I remember we scarcely ventured to look into the white silent country that stretched in front of us; disappointment had rewarded our long searchings so often that we had somehow come to accept it as a matter of course. Squatting down back of the sledge in shelter from the wind seemed of more immediate concern than looking ahead for meat: at least we were sure of the solace our pipes gave. Thus we smoked in silence, with no sign of interest in what the immediate country ahead might hold for us, until Beniah, the leader of my Indians, and an unusually good one, started to his feet with an exclamation and, hurriedly climbing on top a good-sized rock, stretched his arm ahead, obviously much stirred with excitement. He shouted, once and loud, "*ethan*,"[1] and then continued mumbling it as though to make his tongue sure of what his eyes beheld. We all gathered around him, climbing his rock or on other ones, in desperate earnestness to see what he saw in the direction he continued pointing. It was minutes before I could discern anything having life in the distance which reached away to the horizon all white and silent, and then I detected a kind of

[1] Caribou.

vapor arising apparently from some dark objects blurringly outlined against the snow about four miles away; it was the mist which arises from a herd of animals where the mercury is ranging between sixty and seventy degrees below zero, and on a clear day may be seen five miles away. Thoroughly aroused now, I got my field-glasses from my sledge and searched the dark objects under the mist. They were not caribou, of that I was certain; as to what they were I was equally uncertain, for the forms were strange to my eye. So I handed the glasses to Beniah, saying, "*ethan illa*."[1] Beniah took the glasses, but as it was the first time he had ever looked through a pair, their range and power seemed to excite him quite as much as did the appearance of the game itself. When he did find his tongue, he fairly shouted, "*ejerri*."[2] I had no accurate knowledge of what "*ejerri*" meant, but assumed we had sighted musk-oxen. Instantly all was excitement. The Indians set up a yell and rushed for their sledges, jabbering and laughing. It seemed incredible that these were the same men who so shortly before had sat silent with backs to the wind, dejected and indifferent.

[1] Not caribou. [2] Musk-ox.

Every one now busied himself turning loose his dogs, — a small matter for the Indians, with their simply sewn harness from which the dogs were easily slipped, but a rather complex job for me. My dog train had come from the Post, and its harness was made of buckles and straps and things not easily undone in freezing weather; so it happened that by the time my dogs were unhitched, the Indians and all their dogs were fully quarter of a mile nearer the musk-oxen than I and running for very dear life. My preconceived notions of the musk-ox hunting game were in a jiffy jolted to the point of destruction, as I now found myself in a situation neither expected nor joyful. It was natural to suppose some assistance would be given me in this strange environment, and that the consideration of a party of my own organizing and my own paying should be my killing the musk-ox for which I had come so long a distance. But we were a long way from the Post and interpreters and restraining influences; and at this moment of readjustment I speedily realized that it was to be a survival of the fittest on this expedition, and if I got a musk-ox it would be of my own getting. It comforted me to know that, even though some-

what tucked up as to stomach, due to three days' hard travel on only tea, I was in fine physical condition, and up to making the effort of my life.

By the time I had run about two miles I had caught the last of the Indians, who were stretched out in a long column, with two leading by half a mile. Within another mile I had passed all the stragglers, and was running practically even with the second Indian, who was two or three hundred yards behind the leading one. This Indian, Seco by name, was one of the best snow-shoe runners I ever encountered. He gave evidence of his endurance and speed on many another occasion than this one, for always there was a run of four miles or more after every musk-ox herd we sighted, and invariably a foot-race between Seco and me preceded final leadership. I may add incidentally that he always beat me, although we made some close finishes during the fifty-seven days we roamed this God-forgotten bit of the earth.

On this particular day, though I passed the second Indian, Seco kept well in the lead, with practically all the dogs just ahead of him. It was the roughest going I had ever experienced, for the course lay over a succession of low but

sharp, rocky ridges covered with about a foot of snow, and, on the narrow tripping shoes used in the Barren Grounds, I broke through the crust where it was soft, or jammed my shoes between the wind-swept rocks that lay close together, or caught in those I attempted to clear in my stride. It was a species of hurdle racing to test the bottom of a well-fed, conditioned athlete; how it wore on a tea diet I need not say.

After we had been running for about an hour, it seemed to me as though we should never see the musk-oxen. Ridge after ridge we crossed and yet not a sight of the coveted quarry. Seco still held a lead of about one hundred yards, and I remember I wondered in my growing fatigue why on earth that Indian maintained such a pace, for I could not help feeling that when the musk-oxen finally had been caught up, he would stop until I, and all the Indians and all the dogs had come up, so as to more certainly assure the success of the hunt: but it was not the first time I had been with Indian hunters, and I knew well enough not to take any chances.

In another half hour's running, as I worked up the near side of a rather higher and broader ridge than any we had crossed, I heard the

dogs barking, and speeding to the top, what was my disappointment, not to say distress, at beholding twenty-five to thirty musk-oxen just startled into running along a ridge about a quarter of a mile beyond Seco, who, with his dogs, was in full chase after them about fifty yards ahead of me. What I thought at that time of the Northland Indian hunting methods, and of Seco and all my other Indians in particular, did the situation and my condition of mind scant justice then — and would not make goodly reading here. Had I been on an ordinary hunting expedition, disgust with the whole fool business would, I doubt not, have been paramount, but the thought of the distance I had come and the privations undergone for no other reason than to get a musk-ox, made me the more determined to succeed despite obstacles of any and all kinds. So I went on. The wind was blowing a gale from the south when I reached the top of the ridge along which I had seen the musk-oxen run, and the main herd had disappeared over the northern end of it, and were a mile away to the north, travelling with heads carried well out, though not lowered, at an astonishing pace and ease over the rocks. Four had separated from the main body and were

going almost due east on the south side of the ridge. I determined to stalk these four, because I could keep the north side of the ridge, out of sight, and to leeward, feeling certain they would sooner or later turn north to rejoin the main herd. It seemed my best chance. I perfectly realized the risk I ran in separating from the Indians; but at that moment nothing appeared so important as getting a musk-ox, for which I had now travelled nearly twelve hundred miles on snow-shoes.

I have done a deal of hunting in my life, over widely separated and trackless sections, and had my full share of hard trips; but never shall I forget the run along that ridge. It called for more heart and more strength than any situation I ever faced. Already I had run, I suppose, about five miles when I started after those four musk-oxen; and when the first enthusiasm had passed, it seemed as though I must give it up. Such fatigue I had never dreamed of. I have no idea how much farther I ran, — three or four more miles, likely, — but I do remember that after a time the fancy possessed me that those four musk-oxen and I were alone on earth, that they knew I was after their heads, and were luring me

deep into a strange land to lose me; thus in the great silent land we raced grimly, with death trailing the steps of each. The dead-white surface reaching out before me without ending seemed to rise and to fall as though I travelled a rocking ship; and the snow and the rocks danced around my whirling head in a grinning, glistening maze. When I fell, which frequently I did, it seemed such a long time before I again stood on my feet; and what I saw appeared as though seen through the small end of field-glasses.

I was in a dripping perspiration and had dropped my fur capote and cartridge-belt after thrusting half a dozen shells into my pocket. On and on I ran, wondering in a semi-dazed way if the musk-oxen were really on the other side of the ridge. Finally the ridge took a sharp turn to the north, and as I reached the top of it, there — about one hundred yards ahead — were two of the musk-oxen running slowly but directly from me. Instantly the blood coursed through my veins and the mist cleared from my eyes; dropping on one knee I swung my rifle into position, but my hand was so tremulous and my heart thumped so heavily that the front sight wobbled all over the horizon. I realized that this might

be the only shot I should get, — for Indians had gone into the Barren Grounds in more propitious seasons, and not seen even one herd, — yet with the musk-oxen going away from me all the while, every instant of time seemed an insuperable age. The agony of those few seconds I waited so as to steady my hand! Once or twice I made another attempt to aim, but still the hand was too uncertain. I did not dare risk a shot. When I had rested a minute or two, that seemed fully half an hour, — at last the fore sight held true for an instant; and I pressed the trigger.

The exultation of that moment when I saw one of the two musk-oxen stagger, and then fall, I know I shall never again experience.

The report of my rifle startled the other musk-ox into a wild gallop over a ridge, and I followed as rapidly as I could, so soon as I made sure that the other was really down. As I went over the ridge I caught sight of the remaining musk-ox, and shot simultaneously with two reports on my left, which I later discovered to have come from the second Indian whom I had passed in closing upon Seco on the run to the first view of the musk-oxen, and who now hove in sight with one dog, as the second musk-ox dropped.

I found on returning to my kill that it was a cow, needless to say a sore disappointment; and so, although pretty well tuckered out, I again started to the north in the hope that I might get wind of the other two of the four after which I had originally started, or find tracks of stragglers from the main herd. Several miles I went on, but finding no tracks, and darkness coming down, I turned to make my way back, knowing that the Indians would follow up and camp by the slain musk-oxen for the night. But as I journeyed I suddenly realized that, except for going in a southerly direction, I really had no definite idea of the exact direction in which I was travelling, and with night setting in and a chilling wind blowing I knew that to lose myself might easily mean death. So I turned about on my tracks and followed them back first to where I had turned south, and thence on my back tracks to where the musk-ox lay. It was a long and puzzling task, for the wind had always partly, and for distances entirely, obliterated the earlier marks of my snow-shoes.

Nine o'clock came before I finally reached the place where the dead quarry lay; and there I found the Indians gnawing on raw and half-

AT BAY

frozen musk-ox fat. Seco, badly frozen and hardly able to crawl from fatigue, did not turn up until midnight; and it was not until he arrived that we lighted our little fire of sticks and had our tea.

Then in a sixty-seven degrees below zero temperature we rolled up in our furs, while the dogs howled and fought over the carcass of my first musk-ox.

II

The Provision Question

Except in the summer, when the caribou are running in vast herds, venture into the Barren Grounds entails a struggle with both cold and hunger. It is either a feast or a famine; more frequently the latter than the former. So there was nothing extraordinary in being upon our third day without food at the first musk-ox killing to which I have referred. Yet the lack of nourishment was not perhaps as trying as the wind, which seemed to sweep directly from the frozen seas, so strong that we had to bend low in pushing forward against it, and so bitter as to cut our faces cruelly. Throughout my journey into this silent land of the lone North the wind caused me more real suffering than the semi-starvation state in which we were more or less continuously. Indeed, for the first few weeks I had utmost difficulty in travelling; the wind appeared to take the very breath out of my body

and the activity out of my muscles. I was physically in magnificent shape, for I had spent a couple of weeks at Fort Resolution, on Great Slave Lake, and what with plenty of caribou meat and a daily run of from ten to twenty miles on snow-shoes by way of keeping in training, I was about as fit as I have been at any time in my life. Therefore the severe struggle with the wind impressed me the more. But the novelty wore off in a couple of weeks, and though the conditions were always trying, they became more endurable as I grew accustomed to the daily combat.

One of the first lessons I learned was to keep my face free from covering, and also as clean shaven as was possible under such circumstances. It makes me smile now to remember the elaborate hood arrangement which was knitted for me in Canada, and that then seemed to me one of the most important articles of my equipment. It covered the entire head, ears, and neck, with openings only for eyes and mouth, and in town I had viewed it as a great find; but I threw it away before I got within a thousand miles of the Barren Grounds. The reason is obvious: my breath turned the front of the hood

into a sheet of ice before I had run three miles; and as there was no fire in the Barren Grounds to thaw it, of course it was an impossible thing to wear in that region and a poor thing in any region of low temperature. After other experiments, I found the simplest and most comfortable head-gear to be my own long hair, which hung even with my jaw, bound about just above the ears by a handkerchief, and the open hood of my caribou-skin capote drawn forward over all.

I learned a great many things about hunting the musk-ox on this first effort, and not the least memorable was the lesson of how very difficult an animal it is to score on without the aid of a dog. This is solely due to the lie of the land. The physical character of the Barren Grounds is of the rolling or prairie type. Standing on the first elevation after passing beyond the last timber, you look north across a great expanse of desert, apparently flat country dotted with lakes innumerable, and broken here and there by rock-topped ridges. When you get actually into the country, you find these ridges, though not high, are yet higher than they look to be, and the travelling in general very rough. In summer there is no travel over the Barren

Grounds, except by canoe; for barring the generous deposit of broken rock, it is practically a vast swamp. In the winter, of course, this is frozen over and topped by a foot or a foot and a half of snow. It was a surprise to find no greater depth of snow, but the fall is light in the very far North, and the continuous gales pack and blow it so that what remains on the ground is firm as earth. For that reason the snow-shoes used in the Barren Grounds are of the smallest pattern used anywhere. They are from six to eight inches wide, three feet long, and, because of the dry character of the snow, have rather closer lacing than any other shoe. This is the shoe used also throughout the Athabasca-Slave-Mackenzie River sections. The snow nowhere along this line of travel is over a couple of feet in depth, is light and dry and the "tripping" shoe, so called, is the very best possible for such kind of going. In the spring, when the snow is a little heavier, the lacing is more open, otherwise the shoe is unchanged.

It is well known, I suppose, that the Barren Grounds are devoid absolutely not only of trees but even of brush, except for some scattered, stunted bushes that in summer are to be found in occa-

sional spots at the water's edge, but may not be depended upon for fuel. From Great Slave Lake north to the timber's edge is about three hundred miles; beyond that is a stretch of country perhaps of another hundred miles, suggestively called the Land of Little Sticks by the Indians, over which are scattered and widely separated little patches of small pine, sometimes of an acre in extent, sometimes a little less and sometimes a little more. They seem to be a chain of wooded islands in this desert that connect the main timber line (which, by the way, does not end abruptly, but straggles out for many miles, growing thinner and thinner until it ends, and the Land of Little Sticks begins) with the last free growth; and I never found them nearer together than a good day's journey. About three or four days' travel takes you through this Land of Little Sticks and brings you to the last wood. The last wood that I found was a patch of about four or five acres with trees two or three inches in diameter at their largest, although one or two isolated ones were perhaps as large as five or six inches. Here you take the fire-wood for your trip into the Barrens.

I have been often asked why the periods of starvation experienced in musk-ox hunting could

not be obviated by carrying food. I have been asked, in a word, why I did not haul supplies. The patent answer is that, in the first place, I had none to take; and that, in the second place, if I had had a car-load at Great Slave Lake to draw upon, I would have been unable to carry provisions with me into the Barren Grounds. It is to be remembered that Great Slave Lake, where I outfitted for the Barren Grounds, is nine hundred miles from the railroad, that every pound of provision is freighted by water usually, or by dog sledge on emergency. The Hudson's Bay Company's posts, beginning at Athabasca Landing, are located along the great waterways — Athabasca, Slave, Mackenzie rivers — about every two hundred miles. These are small trading posts, having powder and ball, and things to wear, and of ornament, rather than things to eat. Provisions are taken in, but to a limited extent, and there is never a winter which does not see the end of the company's supplies before the ice breaks up and the first boat of the year arrives. There is never a plenty even for the usual demand, and an unusual demand, if it is to be met, means a trimming all round. In snow-shoeing from the railroad to Great Slave Lake I secured

fresh sledge-dogs and men and provisions at every post, which carried me to the next post north, whence men and dogs returned to their own post, while I continued north with a new supply. Although there was comparative plenty at the time of my trip, so carefully are the stores husbanded that I never could get supplies more than just enough to carry me to the next post; and these were invariably skimped, so that for a five days' journey I habitually started with about four days' supplies.

Thus it is easy to see why there were no provisions at Great Slave Lake for me to draw on; and, as I have said, had there been an abundance, it would have been impossible for me to carry them (and would be equally so for any one else venturing into the Barren Grounds at the same season of the year) simply for lack of transportation, which, after all, is the great problem of this North Country. One would think that in a land where the only means of travel for most of the year, where almost the very existence of the people depends so largely on sledge-dogs, there would be an abundance of them and of the best breed; yet the truth is that sledge-dogs of any kind are scarce even on the river thorough-

fares. At the company's posts there is not more than one, or at the most two, spare trains; among the Indians, upon whom, of course, I had to rely when I outfitted for the Barren Grounds, dogs are even scarcer. Fort Resolution is one of the most important posts of the Hudson's Bay Company in all that great country, and yet the settlement itself is very small, numbering perhaps fifty; the Indians — Dog Ribs and Yellow Knives — living in the woods from six to ten days' travel from the post. I found it not only extremely difficult to get Indians to go with me, but secured seven dog teams only after widest search. This reads strange, I am sure, yet it was all but impossible for me to secure the number of dogs and sledges required for my trip.

But, some of my friends have asked, with seven sledges and twenty-eight dogs, surely there was room to carry enough provision to insure against starvation in the Barren Grounds? Not at all. There was not room to carry more than tea, tobacco, our sleeping-furs, and moccasins and duffel socks. Moccasins and duffel and tobacco and tea are the highly essential articles in the Barren Ground outfit. The duffel is a light kind of blanket which is made into leggings and also

into socks. You wear three pairs inside your moccasins, and at night, if you have been well advised, you put next to your feet a slipper moccasin of the unborn musk-ox, hair inside. It must be remembered that in the Barren Grounds you have no fire to thaw out or dry frozen and wet clothing. The tiny fire you do have is only enough to make tea. Therefore abundant duffel and moccasins are necessary, first, to have a dry, fresh change, and second, to replenish them as they wear out, as they do more than elsewhere, because of the rocky going. As for tea and tobacco, no human being could stand the cold and the hardship of a winter Barren Ground trip without putting something hot into his stomach every day, while the tobacco is at once a stimulant and a solace. The space left on the sledge after the tea and tobacco and moccasins and duffel have been stowed must be filled with the sticks that you cut into pieces (just the width of the sledge) at the last wood on the edge of the Barren Grounds proper. The sledge is a toboggan about nine feet in length and a foot and a half in width, made of two or three birch slats held together by crosspieces lashed on to them with caribou thongs, turned over and back at the front

into a dasher, which is covered by a caribou apron (sometimes decorated in crude painting), and held in its curved position by strings of babiche, — as the thongs of caribou skin are called, — the same material which furnishes the snow-shoe lacing. On this sledge is fitted a caribou-skin body, about seven feet in length, the full width of the sledge, and a foot and a half deep. Into this is stowed the load. Then the top sides are drawn together, and the whole lashed firmly to the sledge by side lines. This must be done with the care and security bestowed upon the diamond hitch used on pack-animals; for the sledge in the course of a day's travel is roughly knocked about.

It requires no further explanation, I fancy, to show why it is not possible to carry provisions.

One of my friends on my return from this trip suggested the possibility of shipping dogs into the country; of doing, in a word, somewhat as do the pole-hunting expeditions. That might be possible to a wealthy adventurer, but, even so, I should consider it an experiment of very doubtful results, simply because of the impossibility of feeding the dogs after they had arrived in the country, or of providing for them after you had

started into the Barren Grounds. There is a period in the summer at Great Slave Lake when any number of dogs could be sufficiently fed on the quantities of fish that are then to be caught in the lake; and no doubt enough fish could be stored to feed them in the season when the lakes are frozen, if the dogs remained at the post. Even so, that would keep busy a number of especially engaged fishermen. But when you started for the Barren Grounds with all these dogs, your feeding problem would be an overwhelming one indeed, for only in the midsummer, when the caribou are to be found in large herds, would it be possible to kill meat for a great many dogs; and in midsummer you would not, could not, use dogs at all; at that season the Barren Grounds are invaded by means of the chain of lakes and short portages which begin at the northeastern end of the Great Slave Lake. Even travelling along the river the question of dog feed is a serious one, and you are obliged to carry the fish which have been caught the previous summer and stored at the posts in great frozen heaps. It is obvious, therefore, that there is no easy or comfortable way of getting into the Barren Grounds. It would be impracticable

to do other than rely on the resources at hand and go into the silent land just as do the Indians. It is simply impracticable to do other than to depend on the caribou and the musk-oxen for food for both men and dogs.

III

Seasons and Equipment

Midsummer is the season when the hunter may visit the Barren Grounds with the least discomfort and least danger, for at this time you go by canoe. The caribou are plentiful and the thermometer rarely goes below freezing-point. But even then trials are many, and there is considerable danger of starvation. The mosquitoes are a pest almost beyond endurance, and the caribou, although abundant, are down toward the Arctic and of very uncertain movement. Their course of migration one year may be fifty to one hundred miles east or west of where it was the preceding year. In the 350,000 square miles of the Barren Grounds one may easily go days without finding caribou even at such a time of plenty; and not to find them might easily mean starvation.

The most extensive trips into the Barren Grounds for musk-oxen previous to my venture

OUTNUMBERED

had been made by two Englishmen, Warburton Pike and Henry Toke Munn. Mr. Pike (a hunter of experience whose book, "Barren Ground of Northern Canada," published in 1892, still stands as one of the most interesting and faithful contributions to the literature of sport and adventure) spent the better part of two years in this country, and made several summer and autumn trips into the Barren Grounds. He made one summer trip solely for the purpose of killing and cacheing caribou, which he might draw upon in the next autumn musk-ox hunt when the caribou were scarce. Yet, notwithstanding all this preparation, he had a very hard time of it in the autumn hunt and was unable to accomplish all that he set out to do. He did get, however, the musk-ox he went after. On Munn's autumn trip, although there were yet to be had some fish in the lakes, he and his party and their dogs had a starving time of it indeed. I particularize these two trips to instance the difficulties of hunting in the Barren Grounds, even when the conditions are the most favorable that may be had.

The Indians time their hunting trips into the Barren Grounds by the movement of the caribou,—in the early summer, about May, when the caribou

begin their migration from the woods down to the Arctic Ocean; and in the early autumn when the caribou are fairly well distributed and are working back toward the wood again. Caribou are absolutely essential to penetration of the Barren Grounds, because from the woods to where musk-oxen are found is a considerable distance, and no possible meat except that supplied by these members of the deer family. Nor is a trip into the Barren Grounds always rewarded with musk-oxen. Many Indian parties have gone in and failed to see even a track, and many others have skirmished along the edge, dreading to plunge into the interior, and hopeful perhaps of a stray ox. The Indians, who do not now hunt musk-oxen as much as formerly owing to the lessened demand for the pelt, usually go in parties of four to six; never less than four, because they would be unable to carry a wood supply adequate to getting far enough into the Barren Grounds for reasonable hope of securing the game; and rarely more than six, because when they have got as far into the country as six sledges of wood will permit, they have either got what they want, or they have had enough of freezing and starving to impel a start homeward. Only the hardiest

make the trip; to be a musk-ox hunter and an enduring snow-shoe runner, is the dearest ambition of and the greatest height to which the Far Northland Indian can attain.

Before I started on my trip I heard much of pemmican, and fancied it procurable at almost any northern post, as well as supposing it a reliable source of provender. The truth is, however, that pemmican is a very rare article these days in that section of the country, and in fact is not to be found anywhere south of Great Slave Lake, and only there on occasion. This is largely because the caribou are not so numerous as formerly, and the Indians prefer to keep the grease for home consumption, when at ease in their autumn camps. Even among the Indians around Great Slave Lake pemmican is used but very little in the ordinary tripping (travelling). It has been substituted by pounded caribou meat, which is carried in little caribou-skin bags and eaten with grease. One can never get too much of grease in the Northland, where it is eaten as some consume sugar in the civilized world. And this is to be accounted for by the burning up of the tissues in cold dry climate and the absence of bread and vegetables; for

meat and tea are the sole articles of food. Coffee, by the way, is a luxury to be found only occasionally on the table of a Hudson's Bay Company post factor.

There is so much to be told, if one is to give an adequate idea of what hunting the musk-ox implies, that I find it somewhat difficult, without going to considerable length, to cover the entire field. I suppose it is because the musk-ox is the most inaccessible animal in the whole wide world, that there is so much curiosity concerning the conditions of hunting it, and so much interest in the recital of one's experience. From time to time a great many letters come to me filled with questions, and I am and shall always be happy to add in personal letters any data I may have overlooked here. I am trying, however, to make this chapter thoroughly practical and intelligible to those with any thought of ever seeking the musk-ox in this region. The easiest way, as I have said, is to go by Hudson's Bay Trading boat, which leaves Athabasca Landing as soon as the ice breaks, down to Resolution. If you have arranged beforehand by letter with the factor at Resolution, you will arrive there in time to make a summer hunt into the Barren

Grounds, which is reached, as I have shown, by means of short portages and a chain of lakes, starting from the northeast corner of Great Slave Lake, and following Lockhart's River. If you are not delayed and do not get too far into the Barren Grounds, you would stand a chance of getting out and back to Athabasca Landing on the water; but everything would have to go your way and the trip be most expeditious in order to do this. If you were not out in time to go by open water, it would necessitate a nine hundred mile snow-shoe trip, or laying over until the following spring when the ice broke up again.

The Canadian government has protected musk-oxen for several years, and in order to hunt, one must be provided with a special permit from that government. The protection of the musk-ox seems scarcely necessary, for although the polar expeditions have slaughtered a great many on Greenland and on the Arctic islands, the killing of them in the Barren Grounds proper never has been, and never will be, sufficiently large to give concern to the Canadian government. The musk-ox is of a genus that seems to be a declining type among the world's animals, but if extinction comes to those in the Barren Grounds, it cer-

tainly will never be through their killing by white men or Indians. If any great value attached to the hide, it might be another story; but the truth is that the musk-ox robe is not a valuable fur, is sought after, indeed, but very little. It is too coarse to wear, and the only use to which it seems admirably adapted is as a sleigh-robe.

There is no difficulty in getting Indians for the summer hunt, for then the labor is slight as compared with snow-shoeing, and there need be no considerable worry about provisions. Nor would there be but very little trouble in securing Indians for the early autumn. The great difficulty I encountered in organizing my party was due solely to the time of year in which I made the venture. I was not particularly seeking hardship, but I had to go when I could get away from my professional duties, and that brought me to Great Slave Lake the first of March. February and March are the two severest months of the entire year in the Barren Grounds. It is the time when the storms are at their height and the thermometer at its lowest. No one had ever been into the Barren Grounds at that period, and the Indians, who are very loath to venture into an unknown country or at an unusual season,

were disinclined to accompany me. Indeed it was only by diplomatic handling of the leader and through the extremely kind offices of the Hudson's Bay Company post factor, Gaudet, that I ever succeeded in getting started.

Perhaps it will serve those contemplating such a trip one day, to record here my personal equipment.

One winter caribou-skin robe, lined with a pair of 4-point Hudson's Bay Company blankets.

One winter caribou-skin capote (coat with hood).

One heavy sweater.

Two pairs of moose fur-lined mittens.

One pair moose-skin gloves. (Worn inside of mittens.)

One pair strouds (loose-fitting leggins).

Three silk handkerchiefs.

Eight pairs of moccasins.

Eight pairs of duffel socks.

One copper kettle (for boiling tea).

One cup.

45-90 Winchester half magazine rifle.

Hunting-knife. (See cut page 45.)

Compass.

Spirit thermometer.

10 pounds of tea.

12 pounds of tobacco.

Several boxes of matches.

Flint and steel and tinder.

Two bottles of mustang liniment (which promptly froze solid and remained so; it was fortunate I did not have occasion to use it).

In addition I carried, in case of emergency, such as amputation of frozen toes or other equally unpleasant incidents, — a surgeon's knife, antiseptic lozenges, bandages, and iodoform. Of this outfit no two articles were more important perhaps than the moose-skin gloves and the strouds. The gloves are worn inside the mittens and worn always; one never goes barehanded in the Barren Grounds at any time, day or night, if one is wise. The strouds (reaching above the knee and held up by a thong and loop attached to waist belt) catch the flying and freezing snow dust from the snow-shoes, thus protecting the trousers. I forgot to add, by the way, that I wore Irish frieze trousers, cut small at the bottoms so as to be easily tied about the ankles. My underwear was of the heaviest, and I carried a pair of moccasin slippers made of the unborn musk-ox calf, fur inside. If you ever make a trip after musk-oxen, do not bring in anything from

the outside, except your rifle, ammunition, and knife. Everything else you should secure at the outfitting post. There is nothing in this world that equals the caribou-skin capote for travel in the Northland; it is very light and practically impervious to the wind. You will also carry with you a tepee, made of caribou skin. This tepee, or lodge, is not carried for your comfort or protection against inclement weather, but entirely for the protection of your camp-fire; because the furious wind that sweeps the Barren Grounds in winter would not only blow out your flame but blow away your wood as well. The poles for your lodge you cut at the last wood and lash to the side of the sledge.

In summer time the question of transportation is much simpler; you go by canoe and you do not need strouds or the winter caribou-skin capote. There is a very great difference between the winter and the summer caribou pelts, and the latter is used for the summer trips. Nor do you need a tepee in summer.

IV

Method of Hunting

Among the Indians that live south and west of the Barren Grounds (no Indian lives in the Barren Grounds), the method of hunting the musk-ox is practically the same, and, as I have shown in the early part of this paper, it is because the Indians lack high hunting skill and because their dogs are neither trained nor courageous that bigger kills are not made. White hunters and trained dogs could practically wipe out every herd of musk-oxen they encountered; for while it is true that musk-oxen give you a long run once you have sighted them, yet when you get up to them, when the dogs have brought them to bay, it is almost like shooting cattle in a corral. There is always a long run. I think I never had less than three miles, and in the first hunt which I have described, I must have run nine or ten. But, as I say, when you get up to them it is easy, for they will stand to the dogs so long as the

EAST GREENLAND MUSK-OX CALF

Collected at Fort Conger by Commander R. E. Peary, U.S.N. (From a photograph provided by the American Museum of Natural History)

HEAD OF A TWO-YEAR-OLD MUSK-OX BULL

Killed and photographed in the Barren Grounds by the author. The horns are just beginning to show a downward tendency. Hair over forehead is gray, short, and somewhat curly. The background is the tepee referred to in the text.

dogs bay them. And all this running would be unnecessary if the Indians exercised more hunting skill and judgment.

Although the prairie form of the country is not altogether the best for stalking, yet one could stalk comparatively near a herd before turning the dogs loose. The Indians never do this, and, in addition, the dogs set up a yelping and a howling the moment they catch sight of the quarry. This, of course, starts off the musk-oxen, which invariably choose the roughest part of the country, no doubt feeling, and rightly, too, that their pursuers will have the more difficult time following. Indian dogs are not always to be relied upon, for they have a disposition to hunt in a group, and your entire bunch of dogs is apt to stop and hold only three or four stragglers of the herd while the remainder of the musk-oxen escape. Sometimes when they stop practically the entire herd, the dogs are very likely, before you come up to them, to shift, leaving their original position and gradually drawing together; perhaps, the whole pack of dogs finally holding only half a dozen, while the rest of the musk-oxen have run on. Musk-oxen, when stopped, invariably form a circle with their sterns in and their

heads out; it matters not whether the herd is thirty or half a dozen, their action is the same. If there are only two, they stand stern to stern, facing out. I have seen a single musk-ox back up against a rock. Apparently they feel safe only when they get their sterns up against something.

Hunting musk-oxen on the Arctic Coast or the Arctic islands after the manner of the polar expeditions, is a much simpler proposition. There the hunters are always comparatively near their base of supplies, and, from all accounts, the musk-oxen are more numerous than they are in the interior. According to Frederick Schwatka, the Innuits hunt musk-oxen with great skill. They hitch their dogs to the sledge differently from the method of the Indians to the south. The southern Indians hitch their four dogs in tandem between two common traces, one on each side; while each Eskimo dog has his own single trace, which is hitched independently to the sledge. When the Innuits sight the musk-oxen, each hunter takes the dogs of his sledge, and holding their traces in his hand, starts after the game. The wisdom of this method is twofold: in the first place it immeasurably aids the running

hunter, for the four or five straining dogs practically pull him along; indeed, Schwatka says that when these Innuits come to a hill they squat and slide down, throwing themselves at full length upon the snow of the ascending bank, up which the excited dogs drag them without any effort on the part of the hunter. I should like to add here that if such a plan were pursued in the Barren Grounds over the rocky ridges, the remains of the hunter would not be interested in musk-ox hunting by the time the top of a ridge was reached. Seriously, the chief value of hunting in this style is that the hunter controls his four to six dogs, the usual number of the Eskimo sledge. When they have caught up with the musk-ox herd, he then looses them and he is there to begin action. The Eskimo dogs are very superior in breed to those used by the Indians farther south, and are trained as well to run mute.

The chances of getting musk-oxen in the Barren Grounds are not so good in summer as in winter, because travelling by canoe you are, of course, bound to keep to the chain of lakes, and your course is therefore prescribed, it being impossible to travel over the land at will as it is in winter

when all is frozen. One day's hunting is about like another. There is nothing to kindle the eye of the nature lover. In winter it is like travelling over a great frozen sea; in summer it is a great desolate waste of moss and lichen, dotted with lakes and rock-topped ridges, which observe no one or special form of direction. There is a black moss that the Indians sometimes burn if they can find it dry enough, and a little shrub that furnishes a bitter tea if the tea of civilization has run out. Nearly all of the lakes have fish, and a hunter ought really, with experience and judgment, to go in and out in summer time without suffering any excessive starvation. Warburton Pike, who has studied the Barren Grounds in summer time more thoroughly than any other man living, reports spots covered with wild flowers that grow to no height but in comparative profusion and some beauty.

The distance you make in a summer day of Barren Grounds travel may depend entirely on your inclination, for with the fish and the moving caribou you are fairly well assured against hunger, and the weather is comparatively warm and permits of lingering along the route. It is quite another story in the winter, for then food is always

a problem, and every day draws on your slender supply of wood. Of course the farther you penetrate, the nearer you get to the Arctic Coast, the more likely you are to see musk-oxen; and the faster you travel, of course, the farther you can penetrate. We averaged about twenty miles a day. That means that we kept busy every hour from the time we started until we camped. The hour of starting depended very largely upon whether or not there was a moon. If there was a moon, we would get started so as to be well under way by daylight, which when we first entered the Barren Grounds would be about nine o'clock. If there was no moon, we waited for daylight. There always was a moon unless it stormed; but it stormed most of the time. When there was a moon, however, it was always full. Travelling from Lac La Biche to Great Slave Lake on the frozen rivers, where it was a mere question of getting from one post to another, we used to start about two o'clock in the morning, the sun coming up about ten o'clock and setting at about three, and darkness falling almost immediately thereafter. In this river travelling I averaged a full thirty-five miles a day for the (about) nine hundred miles.

I think the most trying hour of the twenty-four in the Barren Grounds day was at the camping time in the afternoon. Beniah invariably chose the highest and most exposed position to be found, that our tepee might be the more visible to the scouts, kept out all day on either side looking for caribou, or musk-oxen; and there was always the delaying discussion of the Indians amongst themselves, while I, chilled to the bone by the inaction, stood around awaiting the close of the argument before it was possible to get to the business of camp-making. Because the snow was packed so hard as to be impossible to shovel away with the snow-shoe, a rocky site was always sought, where we fitted our bodies to the uneven ground as best we could. With the camp site definitely chosen, a circle was made of the sledges, touching head and tail; then three lodge poles, tied together at the top, were set up in the form of a triangle, with the ends stuck into the sledges to give them firm footing, and the four remaining poles placed so as to make a cone of the triangle. Over and around this was stretched the caribou-skin tepee, with the bottom edge drawn down and outside the sledges. Blocks of snow were then cut and banked up around the outside of

MUSK-OXEN ON CAPE MORRIS JESUP (88° 39′ North Lat.). BROUGHT TO BAY BY DOGS MAY 17TH, 1900

The animals are within a quarter of a mile of the extreme northern limit of the most nor,herly land on the globe. Photograph by courtesy of Robert E. Peary, by whose expedition it was taken.

the tepee and against the sledges; all this by way of firmly anchoring the tepee, which set so low that one's head and shoulders would be in the open when standing upright in the centre; but that was of no consequence, the lodge being set up merely as a protection to the fire. A short pole, also carried along from the last wood, was lashed from side to side of the tepee, on to the lodge poles proper, and from this, attached by a piece of babiche and a forked stick, hung the kettle. Then, all being ready, four or five sticks were taken from the sledges equally, and split into kindling wood with the heavy knife one needs to carry in musk-ox hunting. Of course the fire furnished no warmth; it was not built for that purpose; it was simply to boil the tea, and perhaps I can best give an idea of its size in saying that by the time the snow in the kettle had been melted to water and the water begun to boil, — the fire was exhausted. While it blazed and the tea was making, always the close circle of seven hungry men, shoulder

The Author's Barren Ground Hunting Knife and Ax (14 inches long)

to shoulder, squatted around the light in the fancy that some heat must come from that little jumping flame. Outside that other circle of sledges, the dogs snuffed and sniffed and howled. Once I took off my gloves, with the thought of warming my fingers. I made no second experiment of the kind.

Having drunk the tea, we rolled up in our fur robes, lying side by side around the tepee, with feet toward the fire and head against the sledge, knees into the back of the man next you, and snow-shoes under your head, away from the dogs that would eat the lacing. This was only preparation for sleep; actual sleep, even to men as tired as we were, never came until the dogs had finished fighting over us; for so soon as we were rolled in our robes the dogs invariably poured into the tepee. As there were twenty-eight dogs, and the lodge about seven feet in diameter at its base, I need not further describe the situation. Truth is, that no hour in the day or night was more miserable than this, when these half-starved brutes fought over and on top of us before they finally settled down upon us. In extreme cold weather a dog curled up at your feet or at your back is not unpleas-

ant; but to have one lying on your head, another on your shoulders or hips, or perhaps a third on your feet, and you lying on your side on rocky, uneven ground — take my word for it, the experience is not happy. Of course you are entirely wrapped up, head and arms as well, in your sleeping robe; if you rise up to knock the dogs off, you open your robe to the cold: and the dogs would be back on top of you again just as soon as you had lain down.

It is all in the Musk-ox game; and so you endure.

V

The Musk-ox

Although there is nothing in the appearance or in the life of the musk-ox to suggest romance, yet the Indians and the Eskimo surround it with much mystery. They say it is not like other animals, that it is cunning and plays tricks on them, that it is not safe to approach, that it understands what is said. The Indians among whom I travelled have a tradition that long years ago a woman wandered into the Barren Grounds, was lost, and finally turned into a musk-ox by the "enemy." Perhaps this accounts for the occasional habit these Indians have when pursuing musk-oxen of talking to them, instructing them as to the direction of their flight, etc. Several authors maintain that these Indians, when hunting, do not talk to other animals; but I have heard them jabbering while hunting caribou after the same manner they do when running after musk-oxen. Why the Indians should consider

THE BARREN GROUND MUSK-OX — (*Ovibos moschatus*)

A full-grown bull. (From a photograph provided by the American Museum of Natural History)

the musk-ox tricky or ferocious, appears to me to be the only mysterious element in the discussion; a less ferocious looking animal for its size would, it seems to me, be impossible to find. Several Arctic explorers who have written on the musk-ox also refer to it as "formidable" appearing and "ferocious," but those are the last adjectives that I should apply to the creature. The Indians and some of the Arctic authors also say that it is dangerous to approach, especially when wounded. My experience does not indorse that statement. We encountered about one hundred and twenty-five musk-oxen, killing forty-seven, and I did not see one that even suggested the charging proclivities for which it is given credit. They stand with lowered heads, making a hook at the dogs that are nearest, and on occasion making a movement forward, practically a bluff at charging, but I never saw one really charge a dog, much less a man. I do not believe they can be induced to break the circle they invariably form, as they would, of course, do in charging. On one occasion I wounded a musk-ox badly enough to enable me to run him over and around a series of short ridges finally to a standstill. He was entirely alone, and I was

without a dog, and when I had got to within seventy-five feet of him he suddenly stopped running and faced me, setting his stern against a rock — or, rather, over it, for it was quite a small rock. I walked up to within about thirty or forty feet of him, and took a head shot. I thought to see if I could reach his brain, but the boss of his great frontal horn protects it, except for the small opening of an inch where the horns are divided. Then with an idea of putting a ball back of his shoulder or back of his ear, I tried to get on his side, but as I moved, he moved, always keeping his head straight at me, and we made several complete circles; yet, in that time, — I suppose ten or fifteen minutes — he never offered to charge. If a straggling dog had not come my way and attracted the bull's attention, I probably never would have got the chance of a shoulder shot. Mr. Pike, whom, of living men, I consider to have made the most extended study of the musk-ox, agrees entirely with my view of the animal so far as its charging is concerned. Perhaps the musk-ox might charge if you walked up and pulled his ear, but I doubt if he would under less provocation, and really, I do not feel so certain that he would even then. He seems a

stupid, mild creature, — anything but "ferocious." In one little band of eight which we had separated from the main herd and killed, a yearling calf ran against my legs, seemingly seeking protection from the dogs precisely as a young sheep would.

The musk-ox appears, in fact, to be a veritable link between the ox and the sheep. It has the rudimentary tail, the molar teeth structure, the hairy muzzle, and the intestines of the sheep; while its short and wide canon-bones are like those of the ox, and differ widely from either sheep or goat. The hoofs are large, with curved toes and somewhat concave underneath, like the caribou hoof, which facilitates climbing rocky ridges and scraping away the snow from their only food, the lichen and the moss, for which purpose their horns are also admirably adapted. Mr. Rhodes has advanced the theory of the existence of a transition between the musk-ox and the bison, but the structure of the molar teeth and the rudimentary tail convince Professor R. Lydekker, perhaps the foremost scientific authority, of the impossibility of there being any manner of relationship between the two groups. Scientifically, the musk-ox is of the genus Ovi-

BUS, divided into *O. moschatus*, the Barren Grounds and Greenland type, the *O. wardi* (Lydekker), and *O. bombifrons*, otherwise known as the Harlan's musk-ox, an extinct type that, in a word, differed from the present living type largely in

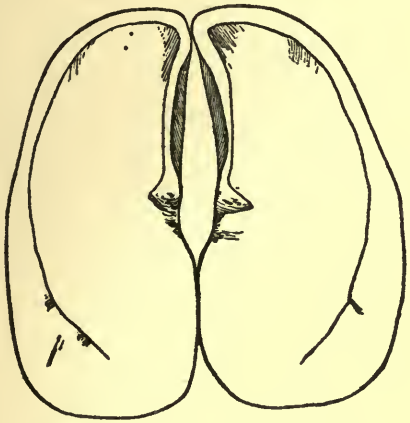
Forefoot of Barren Grounds Musk-ox. ½ actual size

shape of the horns, which did not have the downward curve of those in existence, nor did the curve of the horns come closely to the head as they do now. Until 1898 *O. moschatus* was the only existing type known to either hunters or scientists. In that year, however, Lieutenant Peary, the Arctic explorer, killed in Bache Pen-

FULL-GROWN EAST GREENLAND MUSK-OX — (*Ovibos Wardi*)

Adult male. (From a photograph provided by the American Museum of Natural History)

insula, Greenland, a series of specimens which, on being sent to the Museum of Natural History of New York, were decided by Professor J. A. Allen as having sufficient distinction to warrant classification. Meantime Rowland Ward, the Lon-



Forefoot of East Greenland Musk-ox. ½ actual size

don taxidermist, had secured, by purchase, a couple of similar specimens from East Greenland which Professor Lydekker recognized as a new variety, and in honor of Mr. Ward named *O. moschatus wardi.* Mr. Ward's specimens were secured from whalers who, in turn, got them from trading with natives in East Greenland. Lieutenant Peary's specimens, however, were collected on the ground

by himself, and he is certainly entitled to the honor of the new variety bearing his name. So Professor Allen rightly thinks, and though he has adopted Professor Lydekker's name, he reserves *O. pearyi* (Allen) as a provisionary one which may be accepted for the Grinnell Land animal in case it should prove to be separable. This, however, does not appear likely. The most distinguishing difference between the *O. wardi*, as called, or *O. pearyi*, as it should be known, and the *O. moschatus*, is in the head. The entire front of the new variety head is more or less gray instead of wholly brown, as is the *O. moschatus;* while the horn base of the new variety is much narrower and slightly different in shape from those of the old variety. The skulls of the two varieties are practically alike; at least there is very slight difference. The general color of the fur of the new variety is a little lighter, and the animal itself is not so large or heavily built.

How either variety of musk-ox ever got to Greenland has been a subject of much discussion among scientists who seem now, however, to have finally decided that they reached the island from the west by crossing Smith Sound from Ellesmere Land, and by crossing Robeson's Channel

SKULL OF THE EAST GREENLAND MUSK-OX—(*Ovibos Wardi*)

SKULL OF THE BARREN GROUND MUSK-OX—(*Ovibos moschatus*)

SIDE VIEW — (*Ovibos Wardi*)

SIDE VIEW — (*Ovibos moschatus*)

from Grinnell Land, thence along the low Greenland Coast to East Greenland. Outside of the Arctic islands and of Arctic America so far south as the 62d parallel, the musk-ox is unknown. There was a time, however, when its range included all that part of the northern hemisphere between, roughly speaking, the Arctic Circle and the North Pole. It seems even possible that in the dim ages, the musk-ox had a wider and much more southern distribution, for the skull from which the extinct type *bombifrons* was named, was found in Kentucky, another having been found also in Arkansas. Fossil remains of musk-oxen have been unearthed in Siberia, Alaska, Grinnell Land, and Northern Europe. There is no authentic data of their having been found in Alaska within the memory of present living man, and they do not range within two hundred miles of the Mackenzie River, which is laid down as their western limit. Much has been said of their being of recent existence in Alaska. I made careful search for authentic data concerning their western range, but secured no information at all trustworthy of even a tradition of them in Alaska; while nothing more certain than hearsay handed from father to son did I find as to their being

seen near the Mackenzie River. From time to time statements find their way into print of a musk-ox found in Alaska. Such misleading information is based on the tales of traders who may perhaps have got a musk-ox skin at some Alaskan post. Mr. Andrew J. Stone, who has spent several years in the Far North collecting for the Museum of Natural History, and who knows Alaska and all that great stretch of country west of the Mackenzie River thoroughly, has covered this question in a statement published in an American Museum bulletin in 1901. It touches finally upon a question much agitated, and it seems to me sufficiently important to make permanent record here. Therefore I reproduce it.

AS TO THE WESTERN RANGE OF MUSK-OXEN.

Febr'y 28, 1901.

My dear Dr. Allen: —

In response to your inquiry in reference to the existence of the musk-ox (*Ovibos moschatus*) west of the Mackenzie River, or in Alaska, I will state there are none of these animals in any part of Arctic America west of the Mackenzie. Previous to my departure for the North in the spring of 1897, I had for several years carefully searched for information upon this subject, and from what I had gathered I had a faint hope of finding some of these animals in the mountains west of the

MALE YEARLING OF THE EAST GREENLAND MUSK-OX

(From a photograph provided by the American Museum of Natural History)

Mackenzie, just south of the Arctic Coast. These mountains are known, respectively, as the Richardson, Buckland, British, Romanzof, and Franklin Mountains, but in reality they are the western extension of the main Rocky Mountain range that bends west from the Mackenzie along the Arctic Coast. On reaching the neighborhood of these mountains, however, in the winter of 1898–99, all hope of finding living specimens of musk-ox in them was destroyed.

The Romanzof Mountains, from which specimens of musk-ox are reported to have recently been brought, by way of Camden Bay, are about one hundred and seventy-five miles west of Herschel Island. The Pacific Steam Whaling Company, with offices at No. 30 California Street, San Francisco, have maintained a whaling station at Herschel Island for a number of years; there has also been established there for a number of years a Church of England Mission, under the direction of the Rev. I. O. Stringer. I visited Herschel Island in November and December, 1898, for the purpose of collecting all possible information relative to the animal life of those regions. On my way to and from Herschel Island I sledded the very base of the Davis Gilbert, Richardson, and Buckland Mountains. I stopped over night on both journeys with a lot of Eskimo, at that time hunting the Davis Gilbert Mountains and living in what is known as Oakpik (willow camp), in the extreme western part of the Mackenzie delta, very near the foot of the mountains. Specimens of *Ovis dalli* (white sheep) and of caribou and fur-bearing animals were plentiful in their camp, but there was no sign of musk-ox.

At Shingle Point, on the Arctic Coast, near the Richardson Mountains, I spent several days with a man who was trading with the Eskimo who were hunting the Richardson Mountains. There were several Eskimo in his camp at the time, and he had in his possession skins of the white sheep, caribou, and a variety of fur-bearing animals, but there was no sign of musk-

ox, and I learned on careful inquiry through my interpreter that the natives seemed to know nothing of them, with the exception of one young man who had been to the eastward on one of the whaling ships. The Tooyogmioots, a tribe of Eskimo who once lived along this coast and hunted these different mountains, are now almost extinct. I found between the mouth of the Mackenzie and Herschel Island a very few individuals living in snow houses, but I did not find in or around their places of residence any sign of musk-ox skins, bones, or heads.

I remained at Herschel Island from Nov. 24 to Dec. 14, visiting the Rev. I. O. Stringer and Capt. Haggerty of the steam-whaler, *Mary Dehume*. Both men were able to converse readily with the Eskimo in the Eskimo tongue, and they gave me every possible assistance in making my inquiries. This whole coast far to the westward of Herschel Island is now occupied by the Noonitagmiott tribe of Eskimo. There were a large number of these people at the island, and among them were parties who hunted all the mountains of the mainland mentioned, living in the mountains a great part of the time. Many skins of caribou, sheep, and fur-bearing animals were seen in the possession of these people, but none of them possessed any part of the musk-ox, and the only members of the tribe who knew anything of the musk-ox were those who had been carried to the east by whaling ships. The Rev. Mr. Stringer takes great interest in the natural resources of the country and travels extensively among these people, but he had no knowledge of the existence of any musk-oxen west of the Mackenzie. Capt. Haggerty had wintered along this coast for a number of years, trading extensively with the natives, but he had never secured or heard of a musk-ox skin west of the Mackenzie.

All the whaling ships, which have wintered here for years, sometimes as many as fifteen at the same time, keep Eskimo

hunters in the field continually for the purpose of securing fresh meat for the crews, sending white sailors in charge of dog sleds to visit the Eskimo camps to bring in the meat. It is not uncommon for these sleds to go one hundred and fifty to two hundred miles for meat, and all the mountains to the north and west of Herschel Island have been visited many times by these hunters and sledding parties, without obtaining any trace of musk-ox. Collinson, who wintered near Camden Bay in 1853–54, does not mention the musk-ox. The U. S. Government Survey party, which wintered on the Porcupine several years ago and visited Rampart House, a Hudson Bay trading post at the Ramparts on the Porcupine River, and who went from there with Mr. John Firth, the Hudson Bay Company's trader, north through these mountains to the Arctic Coast and returned, did not find musk-ox. Several white men have travelled back and forth through these mountains from Fort Yukon, on the Yukon River, to Herschel Island, for the purpose of securing sled dogs of the Eskimo on the Arctic Coast, to be used on the Yukon, without securing or learning anything of the musk-ox. Mr. Hodgson and Mr. Firth, both in the service of the Hudson Bay Company, have been stationed at Fort Yukon at the mouth of the Porcupine, at Rampart House on the Porcupine, and at Lapierres House on Bell River, a tributary of the Porcupine, during a period of over thirty years, trading with the Loucheaux Indians, several tribes of which hunt north of these places into the mountains mentioned, without ever obtaining any knowledge of the existence of musk-ox; and the Hudson Bay Company have never secured at any of these posts any skins of the musk-ox.

Previous to the advent of the whalers on this coast, the coast Eskimo also traded at these Hudson Bay posts. The country between the Porcupine River and the Arctic Coast, in which district the mountains above mentioned are situated, is entirely accessible from the north or south, and every part of it

has been hunted for years by the Eskimo and Indians. Barter Island, near Camden Bay, has been the rendezvous of the north coast Eskimo for years, where they meet every summer to barter and trade with each other. At one of these mid-summer festivals there may be seen spotted reindeer skins from Siberia, walrus ivory and walrus skins from Bering Sea, or the stone lamps from the land of the Cogmoliks (the far-away people) of the East, and it is not impossible, though hardly probable, that musk-ox skins might be found there.

I also travelled through the country of the Kookpugmioots and Abdugmioots of the Arctic Coast, east of the Mackenzie. The first people encountered along the coast east of the Mackenzie are the Kookpugmioots — they hunt the coast country as far east as Liverpool Bay, but many of their best hunters never saw a musk-ox. The Abdugmioots originally hunted the Anderson River country, but now live around Liverpool Bay, and most of them have hunted musk-ox. The Kogmoliks, who once lived around Liverpool and Franklin Bays, but who are now practically merged with the Kookpugmioots, along the shores of Allen Channel, have been musk-ox killers.

A good many of the Port Clarence natives, living near Bering Straits, have killed musk-oxen, but only around the head of Franklin Bay and on Parry Peninsula, they having been taken there by whalers. Nearly all the whaling ships pick up Port Clarence natives, on their way north and east to the whaling grounds, and keep them with them until their return, perhaps thirty months later. Some of these vessels have wintered at Cape Bathurst and in Langton Bay at the head of Franklin Bay. Four of these vessels wintered in Langton Bay in 1897–98, and during the winter their Eskimo and sailors killed about eighty head of musk-oxen, most of which were taken on the Parry Peninsula. When I was at Herschel Island, in the winter of 1898, I saw forty of these skins in one of the warehouses of the Pacific Steam Whaling

Company. They were the property of Capt. H. H. Bodfish of the steam whaler *Beluga*.

The range of the musk-ox at the present time does not extend westward to within three hundred miles of the Mackenzie delta. Any information concerning the musk-ox gathered around Point Barrow and thence south to Bering Straits and Port Clarence, has been obtained from natives who have accompanied whaling ships to the East; and all the musk-ox skins that find a market in San Francisco have been purchased, directly or indirectly, from the whaling ships.

Very truly yours,

ANDREW J. STONE.

Wherever explorers have gone into Eastern Arctic North America they have found the musk-ox. Lieutenant Peary, who has spent more time in the Arctic than any other living man, writes that he has killed musk-oxen at Cape Bryant on the Northwest Coast, and at the extreme northern end of Greenland Archipelago, north latitude 83° 39′, and it appears from lack of records to the contrary that they are found on all the Arctic islands except, curiously enough, the Islands of Spitzbergen and Franz Josef Land, where they are unknown. That the musk-ox does not seem to migrate on the ice from island to island as the reindeer do, is another curious fact.

Frederick Schwatka, who hunted along the Arctic Coast, and one or two of the scientists,

place the southerly range of the musk-oxen at the 60th parallel, but this is fully two, if not four, degrees too far south to correctly represent their present range. Hearne saw tracks in latitude 59°, and musk-oxen in latitude 61°, in 1771, but I have never heard of musk-oxen being killed within recent years so far south as the 62d parallel. It is conceivable, however, that they might stray so far south, though in my opinion highly improbable. Pike records a musk-ox killed at Aylmer Lake, in the Barren Grounds. This is the most southerly killing that I have heard of, and the most southerly one of which Mr. Pike makes record. Aylmer Lake is just above the 64th parallel. I saw no musk-oxen below the 65th degree, and it was my experience, as well as Pike's, that musk-oxen are not what you may, comparatively speaking, call plentiful until the 66th parallel.

Some writers persist in calling the musk-ox migratory, but there is no reason for doing so. When fully grown, it is about the size of the English black cattle, its height being 4 feet 2 to 4 inches at the shoulder, and its girth very large for its height. Indians estimate the flesh of a mature cow musk-ox equal to that of about three Barren Grounds caribou, which would be from

ADULT FEMALE OF THE EAST GREENLAND MUSK-OX

(From a photograph provided by the American Museum of Natural History)

three hundred to three hundred and fifty pounds; the bull may go as much as two hundred pounds heavier. They travel in herds varying from half a dozen to thirty or forty. Some authors have referred to "vast herds," no doubt confusing musk-oxen with caribou. Fifty would be a large herd, and I suppose from ten to twenty would fairly represent the size of the average herd. As a rule, such a sized herd would have one or two bulls. I found herds that were all bulls, others that were all cows.

The robe is of a very dark brown, which seems black against the snow, and the hair all over the body is coarse and long, reaching down below the belly to the knees (especially long on the rump, where I measured some that was fifteen to twenty inches), and under the throat it hangs down as a thick mane. There appears to be a decided tendency to a hump, which is emphasized by the shorter stiffish hair that covers shoulders and the base of the neck. And there is a saddle mark of a dirty grayish white. Underneath this hair and over all the body grows a coat of mouse gray wool of fine texture, which protects the animal in winter and is shed in the summer. No wool grows on the

legs, which are massive, and although short, appear to be shorter than they are because of the long hair that falls over them. In running, they have a rolling, choppy kind of a gait, and I noticed when they fell from a rifle wound they could not get on their feet again.

The growth of the horn is very interesting. It begins exactly as with domestic cattle by a straight shoot out from the head. For the first year, it is impossible to tell the difference between the sexes by the horns. In the second year, the bull horn is a little whiter than that of the cow; the forehead of a two-year musk-ox I killed showed a forehead covered with short, curlish hair. In this year the cow's horn begins to show a downward turn, and is fully developed at its third year. The bull's horns, on the contrary, are just beginning to spread at the base in the third year. They continue spreading toward the centre of the forehead until they meet in the bull's fifth year, but in the sixth year they begin to separate, leaving a crevice in the centre which widens as the bull ages until it is from an inch to an inch and a half wide. In the cow these crevices also open by age to even a greater extent than in the bull. The horns of both bull and cow darken as they reach

their full development, until they are quite dark from six to eight inches toward the base; and as the animal ages the extreme darkness of horn disappears, until finally in the old animal of either sex there remains only a black tip about a couple of inches on the very point of the horn. As the crevice between the horns in both sexes widens, the base of the boss on each side thickens to at least three inches in the bull and two or less in the cow. On the boss the horn is corrugated, but at the turn it becomes smooth, and is polished like an ox horn on the point.

The largest horns of which I believe there is record are owned by a taxidermist who purchased them; but the locality from which they came is unknown. Their breadth, measured up and down at the crevice of the boss, or, technically speaking, the breadth of palm, is $13\frac{3}{4}$ inches; the length of horns on outside curve, $30\frac{1}{4}$ inches. The next largest pair is in the British Museum and measures $13\frac{1}{8}$ inches in breadth and $26\frac{1}{4}$ in length. The third is $12\frac{3}{8}$ by $26\frac{3}{4}$, presented to the British Museum by J. Rae, an old time Hudson's Bay Company factor, and got on the Barren Grounds. The next is $12\frac{1}{2}$ by $27\frac{1}{4}$, the property of the Earl of Lonsdale, who picked up

the head on his way down the Mackenzie River, several years ago. Warburton Pike holds the two next heads, one 11 by $26\frac{7}{8}$, and the other 11 by $24\frac{3}{4}$. The largest head I killed is rather remarkable in respect to length of horn and thickness of the boss. Indian hunters who saw it, at all events, considered it most unusual. It measures $11\frac{1}{2}$ by $27\frac{1}{2}$; width of crevice, $1\frac{1}{3}$ inch; thickness of boss at crevice, $3\frac{3}{4}$ inches.

The flesh of the musk-ox is exceedingly tough, and by no means pleasing to the taste, especially in the rutting season (August and September), when it is practically uneatable. There is a certain musky odor, but it is not so pronounced as generally said to be. In fact the only distinct musk-ox odor is got from breaking and crushing the dry dung. As indicative of this queer creature, I may add that musk-ox dung is but very little larger than and of very near the shape and color as that of the large hare. The flesh of the cow is by no means choice, but it is not bad; the flesh of the calf I found to be rather tasteless. The unborn calf is considered quite a delicacy, of which my Indians did not deny themselves merely because we had no cooking fire. They ate it raw, just as they took it from the mother's

MUSK-OX CALF

This specimen was captured March, 1901, east of Lady Franklin Bay, about 30 miles inland, by Indians sent out by Captain H. H. Bodfish of the whaler *Beluga*. After being exhibited in San Francisco, Chicago, and New York, it was bought by Hon. William C. Whitney, who presented it forthwith to the New York Zoological Society. It died within a few months after. It was the first live member of the musk-ox family ever brought to the United States. (Photograph used by permission of the New York Zoological Society.)

stomach. Cows never give birth to more than one calf at a time, born in June.

On only two occasions have musk-oxen been brought alive into captivity in North America. One of these was an eighteen months' old female caught east of Lady Franklin Bay, about thirty miles inland, by a party sent out by Captain H. H. Bodfish, of the whaler *Beluga*. This was exhibited at the Sportsmen's Show in New York, where it was purchased by the Hon. William C. Whitney and presented to the Zoological Society of New York in March, 1902. The other was a younger specimen caught in Northeastern Greenland by Lieutenant Peary and brought out and presented to the Zoological Society by him in October of the same year. Both specimens, however, died within a few months. Up to now I believe something like a dozen live specimens have been taken out to the civilized world. All, however, at this writing, have died, except two or three. One is in a zoological garden at Copenhagen, another in a zoological garden at Berlin, and another is in England, owned by the Duke of Bedford, but exhibited, I am told, in London.

AGRICULTURAL LIBRARY
UNIVERSITY OF CALIFORNIA
CITRUS RESEARCH CENTER AND
AGRICULTURAL EXPERIMENT STATION
RIVERSIDE, CALIFORNIA

MUSK-OX

(OVIBOS MOSCHATUS[1])

In spite of its name this Arctic ruminant has no near affinity with the members of the ox tribe, the cheek teeth being more like those of the sheep and goats, the muzzle, except for a small strip between the nostrils, hairy, and the tail reduced to a mere stump concealed among the long hair of the hind quarters. On the other hand, the resemblance to the sheep is not very close, the horns, which in old males nearly meet in the middle line of the forehead, being of a totally different form and structure, and the skull likewise very distinct. In the males the horns are much flattened and expanded at the bases, after which they are bent suddenly down behind the eyes, to curve upward at the tips. In the females they are much smaller, less expanded, and not approximated at their bases. In both sexes their texture is coarse and fibrous, and their color yellow. The long coat of dark brown hair, depending from the back and sides like a mantle, affords an adequate protection against

[1] "Records of Big Game," Rowland Ward, third edition.

the rigors of an Arctic winter; and the broad, spreading hoofs, with hair on their under surface, give a firm foothold on snow and ice. Two races are known—the typical Canadian and the Greenland (*O. moschatus wardi*). The latter is characterized by the presence of a certain amount of white on the forehead and the smaller expansion of the horns. Height at shoulder about 4 feet; weight of one weighed in parts, 579 pounds (D. T. Hanbury).

Distribution.—Arctic America, approximately north and east of a line drawn from the mouth of the Mackenzie River to Fort Churchill on Hudson Bay, Greenland, and Grinnell Land, in latitude 32° 27′; approximate southern limit, latitude 40° N.

MEASUREMENTS OF HORNS

LENGTH ON OUTSIDE CURVE	BREADTH OF PALM	TIP TO TIP	LOCALITY	OWNER
—30¼	13¾	30¼	?	W. W. Hart
27⅞	10	27½	Barren grounds of northern Canada	David T. Hanbury
—27½	11⅜	23	Barren grounds of northern Canada	Caspar Whitney
27¼	12½	27	Barren grounds of northern Canada	Earl of Lonsdale
—27¼	10⅝	27½	Barren grounds of northern Canada	Imperial Museum, Vienna
26⅞	11	27	Barren grounds of northern Canada	Warburton Pike
26¾	12⅜	..	North America	British Museum (J. Rae)
26¼	13⅛	27⅝	North America	British Museum
—25⅝	10	25	North America	Dr. Albert von Stephani
24¾	11	25½	Barren grounds	Warburton Pike
24¼	7½	19	Barren grounds	J. Talbot Clifton
24¼	10½	26	Barren grounds	Hon. Walter Rothschild
24	9¾	23⅛	North America	Sir Edmund G. Loder, Bart.
—24	..	25	?	Major W. Anstruther Thomson
23¼	6	22¾	?	A. Barclay Walker
—21½	9	27	?	Dublin Museum
—♀21⅛	4¾	20⅝	?	Imperial Museum, Vienna
♀ 18⅝	4¼	..	North America	British Museum (A. G. Dallas)
♀ 17	4⅝	9⅞	North America	Dr. Albert von Stephani

MUSK-OX (*Ovibos moschatus wardi*)

24¾	8¼	22½	Greenland	Rowland Ward
24½	7¼	27	Greenland	Rowland Ward

THE BISON

By George Bird Grinnell

THE LAST OF THE HERD

THE BISON

The buffalo was the largest and economically the most important of North American mammals. It was also one of the most numerous, and over a great area of the continent was practically the sole support of its aboriginal inhabitants. Within the memory of men who as yet are hardly middle-aged, it roamed the country between the Missouri River and the Rocky Mountains, in multitudes so vast that it was commonly stated that its numbers could not be materially reduced, that it would exist long after the speakers had died. Yet, within thirty years it has so absolutely disappeared that the number of living wild buffalo existing to-day is probably not greater than the herd of European bison — commonly, but erroneously, called aurochs — so carefully preserved in the forests of Lithuania by the Russian Czar.

The history of the buffalo's extermination has been many times written, and the cause of its disappearance is not far to seek. It was killed in

great numbers by the Indians, who used its flesh for food, its skin for clothing and for their shelters. Yet, under natural conditions, the destruction which they wrought was never very extensive, and was more than compensated for by the annual increase. Wolves, bears, and other wild animals which were found in great numbers throughout the buffalo's range in old days, devoured many of them; but these were largely the aged, wounded, and crippled, or those which were drowned in the rivers, or mired in quicksands and mud-holes. All this destruction by natural enemies did little more than keep the race in good condition, by cutting off the sickly and the feeble.

When, however, the white man appeared on the scene, new conditions arose. The buffalo had a robe which was as useful to the white man as to the Indian. A trade speedily sprang up in these robes, which the Indians were glad to kill and tan for a cupful of sugar, or a few charges of powder and ball, or a drink or two of alcohol. Now, the Indians had a motive for killing which heretofore they had not had. They killed more buffalo and made more robes than before, but still they made no impression on the wandering millions which swayed to and fro under the influ-

ence of the seasons. Steamboats might pass down the Missouri River loaded to the guards with bales of robes, but the vast herds of buffalo showed no diminution. The early white explorers, or trappers, or traders, did not themselves take the trouble to collect buffalo hides; there were more valuable furs in the country, beaver and otter and bears, which brought better prices, and — more important than this — did not require to be tanned before they became marketable. For a buffalo skin untanned was never shipped; it was only after some Indian woman had expended on it days of patient labor, that it would bring at the trading post the pitiful reward which the white man gave.

At last, however, — and that was less than forty years ago, — a railroad began to push its way out on to the broad plains lying between the Missouri River and the Rockies, and to thrust itself into the very region where the buffalo fed. Over the shining rails of this railroad trains began to pass, carrying passengers; and among these were many white men eager for gain. These at once saw the possibilities of the buffalo. At first they killed them for meat, but soon the hides began to be shipped also. And other men, learning that

the buffalo hides brought $2.00 each, and that buffalo were to be had for the trouble of shooting them, crowded into the range.

Then there began along the Platte Valley in Nebraska, a scene of slaughter which has seldom been equalled. The country was full of buffalo skinners. Each hunter had his teams, and his gangs of skinners which followed him about from place to place, and cared for the hides of the beasts which he killed. In some places the only water accessible was the Platte River, and here the buffalo came to drink. Here, too, the hunters, concealed in ravines or in rifle-pits that they had dug, shot down the beasts one by one, as they came to water, and, indeed, formed so complete a cordon along the river's banks, that the buffalo could not get through and turned back into the hills. When at night the thirsty herds tried to approach the river under cover of darkness, they found that the hunters had built along the bottom great fires, which they kept up all night, and which the scared buffalo did not dare to pass.

It took but a little time to split the herd which for centuries had passed across the valley north and south with the seasons. It was about 1870 when this work began, and in 1874 the buffalo

were last seen in the valley of the Platte. The herd had been split.

As other railroads to the southward pushed into the buffalo country, the same scenes were enacted. The buffalo country swarmed with hunters who came in constantly increasing numbers, so that none of them earned any money by their butcher's work. The price of hides fell, but the buffalo continued to be slaughtered. Hundreds of thousands of hides went to market, but these were only a small proportion of the buffalo killed. Colonel Dodge has expressed the belief, that of the buffalo killed, only one-fourth or one-fifth reached a market. It is conceivable that the proportion was even less. A very large number of the hunters knew nothing about hunting, or shooting, or skinning a buffalo, or curing its hide. The number of maimed and crippled animals that went off to die was very large. The number of hides ruined in skinning was large, and the number improperly cured was still larger.

By the latter part of 1874, buffalo to the southward of the Platte River began to be very scarce, and in 1876 they were almost gone. After that none were found in the southern country except a few in the southern portion of the Indian

Territory and in the waterless country of the pan-handle of Texas. There, protected by the drought, and so few in number as to present little attraction to the skin hunter, a few lingered for some years, until finally captured or destroyed by Buffalo Jones in his expeditions after calves for domestication.

In the northern country the buffalo lingered longer. The Northern Pacific Railroad, built as far west as Bismarck on the Missouri River in 1873, stopped there for six or seven years, and it was not until it had been continued well beyond the Missouri that it again entered the buffalo range and brought with it, as was inevitable, the buffalo skinner. When he came, he did the work he had done in the South, and did it as effectively. But as the number of buffalo left in the northern herd was small, it took only two or three years to destroy them.

After 1883, except for a band of about five thousand which had been overlooked on one of the Sioux reservations, there were no buffalo left in the northern country except a few scattering individuals, which, hidden in out-of-the-way places, had been overlooked by the hunters and Indians, and so for a year or two were preserved

from slaughter. In the arid region about the heads of the Dry Fork and Porcupine Creek in Montana, one of these little groups was left, which yielded to expeditions sent out by the National Museum and the American Museum of Natural History, a series of specimens, probably the last of this species ever to be collected for science. They were brought together just in time, for since then there have been no buffalo.

A small herd of the so-called wood bison still inhabits the vast wilderness between Athabasca Lake and Lesser Slave Lake, but their numbers are few. In the year 1900 there were two little bunches of wild buffalo in the United States, perhaps neither of them numbering more than fifteen or twenty head. In the summer of 1901 one of these bunches, which had long ranged in Lost Park, Colorado, was wiped out by poachers, while for some years nothing has been heard of the other little band which ranged in Montana, and which, in 1895, numbered forty or fifty head, no less than thirty-two of which were killed a year or two later by Red River half-breeds who made a special trip to their range. At present the only important band of buffalo in the United States is that ranging within the confines of the National

Park, and it is altogether probable that this does not number more than twenty-five or thirty.

No doubt the extraordinary abundance of the buffalo had something to do with the wastefulness of the slaughter which followed the railroad building into the buffalo range. Many people no doubt really believed that in their time the buffalo could not be exterminated. They seemed to reason that as there always had been "millions of buffalo" there always would be. Men killed buffalo for any foolish, childish reason that might come into their heads, — to try their guns, to see whether they could hit them, for fun!

How wantonly even some of the first traders destroyed them is often shown by the few writings that have come down to us from those early days. Henry, in his Journal of August, 1800, tells of the way in which he and some of his men passed the time while waiting for others of his people to come up. He says, "We amused ourselves by lying in wait, close under the bank, for the buffalo which came to drink. When the poor brutes came to within about ten yards of us, on a sudden we would fire a volley of twenty-five guns at them, killing and wounding many. We only took the tongues. The Indians suggested that

we should all fire together at one lone bull which appeared, to have the satisfaction, as they said, of killing him stone dead. The beast advanced till he was within six or eight paces, when the yell was given, and all hands let fly; but instead of falling he galloped off, and it was only after several more discharges that he was brought to the ground. The Indians enjoyed this sport highly — it is true, the ammunition cost them nothing."

There has been much misunderstanding as to the former distribution of the buffalo over the North American continent, and the extent of territory through which it was found. Many respected authorities have declared that it occurred in Eastern Canada, and generally along the Atlantic slope; in portions of New England, the Middle states, and south even into Florida. It was said in general terms that the buffalo occurred over the entire continent of North America, from Florida to the 50th degree of north latitude.

These loose statements were corrected by Dr. J. A. Allen, in his most important monograph on the American bisons, and it is now well understood that the range of the buffalo included only about one-third of the continent; that, while it was

found on the Atlantic slope, this was only in the southeastern portion of its range; while in Canada, New England, and Florida, it was probably unknown.

The error into which early writers were led on this subject undoubtedly arose from the terms used by the earlier explorers, who spoke constantly of *vaches*, or *vaches sauvages*, and less frequently of buffu or buffle. But the term *wild cows*, used by the early French Jesuits and English explorers, referred to the elk (*Cervus canadensis*), while the words *buffu* or *buffle* were used to designate moose (*Alces*). In some of the narratives of the journeys of the Jesuit travellers, there appear on almost every page references to the herds of *vaches sauvages*, and many of these writers, at one time or another, describe these wild cows in such unmistakable language as to show beyond question that they were the elk or wapiti.

Dr. Allen assigns the Alleghany Mountains as the general eastern boundary of the range of the buffalo, although explaining that it frequently passed beyond that range, and showing conclusively that it occurred in the western portions of New York, Pennsylvania, Virginia, North and South Carolina and Georgia. Mr. Hornaday

cites some evidence to show that it occurred in the District of Columbia, and quotes Francis Moore, in his "Voyage to Georgia," to prove that there, at least, buffalo were found close to the salt water.

While Dr. Allen gives the Tennessee River as the southern boundary of the buffalo's range, west of the Alleghanies and east of the Mississippi River, Mr. Hornaday quotes a number of references to show that it occurred in some numbers in what is now the state of Mississippi, and gives a tradition of the Choctaws, narrated by Claiborne, in regard to the disappearance of the species from that section. This tradition is to the effect that during the early part of the eighteenth century a great drought occurred there by which the whole country was dried up. For three years not a drop of rain fell. Large streams went dry, and the forest trees all died. Up to that time, it is said, elk and buffalo had been numerous there, but during this drought these animals crossed the Mississippi River and never returned.

In the eastern portion of its range, the Great Lakes formed a barrier on the north which the buffalo did not pass; but from western New York

westward, it was found in numbers along the southern shores of these lakes, and in the territory now Ohio, Indiana, Illinois, Michigan, and Wisconsin. Audubon tells us that in the first years of the nineteenth century there were buffalo in Kentucky, but declares that about 1810, or soon after, they all disappeared. This disappearance was due chiefly to their actual destruction by white men and by Indians, and not, as is commonly stated, to the retiring of the great herds before the advance of settlement and civilization. It seems that the last buffalo were killed east of the Mississippi River about the year 1820, although it may be that in Wisconsin and Minnesota they lasted somewhat longer.

West of the Great Lakes, and turning sharply northward so as to run nearly northwest, the eastern border of the buffalo's range west of the Mississippi was a line running very near the western extremity of Lake Superior, up through the Lake of the Woods, west of Lake Winnipeg, and thence northward to and beyond the Great Slave Lake. There this border line turned to the west, and then sharply to the south, and meeting the Rocky Mountains not far from where Peace River leaves them, followed the range south, about to the 49th

parallel; and then turning southwestwardly and including Idaho, a part of eastern Oregon, the northeast corner of Nevada, the greater portion of Utah, and most of New Mexico, the line passed down south well into Mexico, turning eastwardly just north of the 25th parallel of latitude, and running north to the coast, which it followed around again to the mouth of the Mississippi.

As it has been known in our day, the buffalo in the southern portion of its range was a trans-Missouri animal. North of the parallel of 45 degrees it was found in equal numbers on both sides of the Missouri River, and in its northern extension reached, and possibly even to-day reaches, north to Great Slave Lake; for, as already stated, the only considerable band of wild buffalo to-day is the wood bison of the north, estimated to number four hundred or five hundred.

Besides the boundaries thus set forth, it is probable that in early days there was a considerable extension of the buffalo's range northward and westward, into portions of what is now Alaska. Certain it is that in that territory buffalo remains have been found in great numbers. Some of these skulls belong to species long extinct, and much larger than the American bison; but, on the other

hand, there are many which are closely similar to that species.

The range of the buffalo to the west of the Rocky Mountains began to contract not very long after the narrowing of its range on the east. The earlier explorers in the West, from Pike downward, report buffalo in abundance. Yet, as already stated, the westernmost point at which their remains have been found is among the foot-hills of the eastern side of the Blue Mountains of Oregon. In 1836, it is reported, buffalo were abundant in Salt Lake Valley, but there nearly all were soon afterward destroyed by deep snows, which covered the ground for a long period of time. This corresponds well with statements made to me by John Robinson, better known in early days as Uncle Jack Robinson, one of the old-time trappers, who died between 1870 and 1880. In 1870 he told me that the buffalo on the tributaries of the Green River and on the Laramie Plains had all perished nearly forty years before, during a winter when very deep snows fell, followed by a thaw and subsequent cold, which crusted the snow so that the buffalo could not get through it, and starved to death. This statement was confirmed by the

small number of remains, most of them extremely old and weathered, which we found in this region at that time. On the other hand, on upper tributaries of the Green River buffalo were found much later, and it is possible that these may have been animals which wintered in narrow valleys of the mountains, where, during this deep snow, food was accessible. Fremont states that in the spring of 1824 buffalo were abundant as far west as Fort Hall, while Bonneville reported them in extraordinary abundance in the Bear River Valley.

The mere fact that buffalo were not seen by an explorer who passed through any given territory does not necessarily show that they did not range in that country. I have travelled for months through a buffalo range without seeing buffalo or any evidence of their very recent presence, yet the signs found showed conclusively that a short time before they had been there in vast numbers. It would have been perfectly possible for two honest reports, made a few months or years apart by explorers who were not prairie men, absolutely to contradict each other.

Although the buffalo disappeared from the country west of the Green River, and even from the Laramie Plains, a long time ago, it lin-

gered much later on tributaries of the Platte River further to the northward. There were buffalo on the Sweetwater and its tributaries between 1870 and 1880, and on certain other tributaries of the North Platte River between 1880 and 1890. About this same time there was a small band ranging in what is called the Red Desert Country, south of what is now the National Park. But the last of these disappeared about 1890.

The color of the buffalo is well understood to be a dark liver brown over most of the body, changing to black on the long hair of the fore legs, muzzle, and beard. The long hair on the hump is yellowish, faded from sunburn, and often much the color of the hair of a "tow-headed child." The mountain bison, which lives largely in the timber, and is scarcely or not at all exposed to the sun, is much darker, sometimes almost black, throughout.

Very rarely buffalo of unusual color were seen. These were sometimes roan, sometimes gray or spotted with white, or even pure white throughout. A hide taken on the upper Missouri about 1879 was white on the head, legs, and belly, and elsewhere of normal color; the result was that

when the animal was skinned and the hide tanned there was a fine robe of the ordinary color bordered with a wide band of white. If I recollect aright, this particular hide was sold on the river to an Englishman for $500.

Buffalo of unusual color, being so seldom seen, were regarded by the Indians with great reverence. Among the plains tribes, the buffalo, on which they depended for food, shelter, and clothing, was sacred. Its skull was usually placed on the ground near the sweat lodge, prayers were made, and the pipe was offered to it, in a petition to the buffalo to remain with them, to be abundant, and even to run over smooth ground, so that their horses should not fall during the chase. If buffalo in general were sacred, how much more should the white one receive reverence. The Pawnees cherished their skins as sacred objects, and kept them in their medicine bundles, or used them to wrap about these bundles. The Blackfeet regarded white buffalo as especially dedicated to the Sun, and hung up the white robe as a votive offering to that deity. In the same way, the Cheyennes, in old times, sacrificed the hide of a white buffalo to the Sun, although later, after their habits had been measurably changed by

contact with the whites, they sometimes sold such robes.

My friend George Bent — son of Col. William Bent, one of the historic characters of the early West — tells me that during a long course of trading among the Cheyennes and Arapahoes, he has seen but five robes that could fairly be called white. One of these was silver-gray, another, white, a third, cream color, the fourth, dapple gray, and the fifth, yellowish fawn color. He tells me that in ancient times the white buffalo was regarded by the Cheyennes as sacred, and that, if one of them killed a white buffalo, he left it where it fell, taking nothing from it, and not even putting a knife into it. The Cheyennes believe that any white buffalo belongs far to the north, and comes from that region where, according to their tradition, the buffalo originally came out of the ground.

A great many years ago a war party of Cheyennes went up north against the Crows. One day they came to a hill, and when they looked over it they saw before them great herds of buffalo lying down, and among them a cow, perfectly white. When the buffalo stood up to go to water, the white cow also stood up, and went with them, and it was observed that none of the other buffalo

went very close to her. They did not appear to fear her, but they did not crowd close about her; they gave her plenty of room, as if they respected her. This led the Cheyennes to think that the white buffalo was a chief among other buffalo.

The women of the Cheyennes did not dress a white buffalo's hide. When occasion arose for such work, it was commonly done by some captive woman; for example, a Kiowa, or a Pawnee, — some one who was not bound by Cheyenne customs and Cheyenne fears. Rarely, a Cheyenne woman went through a certain ceremony, being prayed over by a medicine-man, and painted in a peculiar fashion; this ceremony removed the tabu, and she might then dress the white robe.

The habits of the buffalo were in most respects those of domestic cattle. They fed in loose herds as cattle do, the members of a family — that is to say, the old cow and her progeny, sometimes up to three or four years old — keeping together; the old bulls, lazier, heavier, and less active than the cows and the younger stock, were usually on the outskirts of the herd, and if it was slowly moving in any direction, were likely to be behind. Much has been written concerning the intelligence of the buffalo, and the manner in which the bulls

stood sentry over the herd, constantly on the watch for danger. There is not and never was any foundation for these stories, which were mere creations of the writer's imagination. As a matter of fact, the cows were much more alert and watchful than the bulls, were always the first to detect danger and to move away from it, while the bulls were dull and slow, and often did not start to run until the herd at large was in full flight. Moreover, the cows and younger animals of the herd were much swifter than the bulls, and so pressed constantly to the front, while the bulls brought up the rear. The disposition of the males had nothing to do with any desire to protect the herd, but resulted from the fact that they were slower than the others. The earlier writers on the habits of these and other animals, credited them with human motives and aspirations, which of course they do not possess. A somewhat similar fashion of writing about animals is current at the present day, but is false and unnatural, and will pass.

The hides of the buffalo are in their best condition in the early part of the winter, and it was the practice of the Indians to collect their robes at that time of the year, — namely, between

November and January. Soon after January, however, the hair begins to grow loose, and it is shed during the spring and early summer, though often great patches cling to the body until late summer or early fall. I have seen buffalo in the month of July still clad in what looked like a loose robe, the old hair hanging together in an almost complete mat, covering the body. Usually, however, by rubbing against trees, rocks, and banks of dirt, and by rolling on the prairie, the loose hair is got rid of by early summer. In very old animals the moult takes place later and less easily than in those in good condition, and sometimes old and lean buffalo do not seem to shed their coats completely.

The rutting season begins in July and lasts about two months. During this time frequent battles take place among the bulls, apparently fierce on account of the size and activity of the combatants, but usually without important results. These fights are much like similar contests between domestic bulls; they paw up the ground, kneel down and thrust their horns into the earth, mutter and bellow and grunt; but although they charge on each other with fury, and come together with a tremendous shock, the

contest usually ends in nothing more important than the driving off, for a time, of the weaker bull. From their great activity at this season, the bulls rapidly lose flesh; but after the rut is over, they regain it, so that by the beginning of the cold weather they, like the cows, are fat and in good order.

The buffalo cow produces, usually, a single calf, which may be born during the months of March, April, May, or June. The usual time for the calves to be born is in April and May. Shortly before that time the mother separates herself from the herd, which, however, she rejoins not long after the birth of the calf. Like many other ruminants, the mother hides her calf when it is small and weak, but does not wander far from it. After it has gained some strength it joins other calves, and these usually keep together a little apart from the main herd, their mothers coming to them from time to time in order that they may nurse.

When first born, the calves are reddish yellow in color, do not possess any noticeable hump, and look very much like ordinary domestic calves, except that possibly the tail is slightly shorter. Before very long, however, they commence to

grow darker in color, and I have seen calves in August that at a little distance seemed almost as dark as the adult buffalo.

The cow is devoted to her calf, and is ready to fight for it against any enemy except man. Usually, in the buffalo chase, the cow, thoroughly frightened, paid no attention to the calf. But, on the other hand, cases have occurred, where men have been capturing calves to rear in captivity, in which the cow refused to desert her offspring, but turned upon the captor of the calf and charged him with the utmost boldness.

Colonel Dodge instances a case where a number of bulls devoted themselves to protecting a calf against wolves. He says, "I have seen evidence of this many times, but the most remarkable instance I ever heard of was related to me by an army surgeon who was an eye-witness. He was one evening returning to camp after a day's hunt, when his attention was attracted by the curious actions of a little knot of six or eight buffalo. Approaching sufficiently near to see clearly, he discovered that this little knot were all bulls, standing in a close circle with their heads downward, while in a concentric circle, at some twelve or fifteen paces distant,

sat, licking their chops in impatient expectancy, at least a dozen large gray wolves — except man, the most dangerous enemy of the buffalo. The doctor determined to watch the performance. After a few moments the knot broke up, still keeping in a compact mass, and started on a trot for the main herd some half mile off. To his very great astonishment, the doctor now saw that the central and controlling figure of this mass was a poor little calf, so newly born as scarcely to be able to walk. After going fifty or one hundred yards, the calf lay down; the bulls disposed themselves in a circle as before, and the wolves, who had trotted along on each flank of their retreating supper, sat down and licked their chops again. This was repeated again and again, and although the doctor did not see the finale (it being late and the camp distant), he had no doubt that the noble fathers did their whole duty by their offspring, and carried it safely to the herd."

We may imagine that this was an unusual occurrence; at the same time, it is true that a group of buffalo, if one of their number is attacked or threatened by wolves while they are close together, will all rally to the general

defence, and will stand by each other. But that the bulls make it their business to defend calves, or systematically preserve anything except their own skins, I do not believe.

Few people who have seen the buffalo only in captivity, few even of those who have hunted them on the level plains, have any idea of the agility of this clumsy, heavy creature, or of the disposition that it shows to reach elevated points, so difficult of access that a horse might find it a hard matter to climb them. In old times, one might see buffalo ascending steeps that were nearly vertical; or, on the other hand, throwing themselves down the sides of mountains so sharply sloping and rough that a horseman would not dare follow them. Like many other animals, wild and tame, they often liked to seek elevated points from which a wide view might be had, and I have found their tracks and other signs on points high up in the mountains, where only sheep or goats would be looked for. The mountain bison, so-called — and by many hunters regarded as a species quite distinct from the buffalo of the plains — was especially given to frequenting the peaks in summer; no doubt in part to avoid the attacks of

flies, but also in part — as I believe — from sheer love of climbing.

Like most other herbivorous animals, the buffalo was subject to panics, and was easily stampeded, and when thoroughly frightened, a herd ran for a long way before stopping. When alarmed, they huddled together as closely as possible, running in a dense mass. The result of this was that only the animals on the outskirts of the herd could see where they were going; those in the centre blindly followed their leaders and depended on them. This very fact was a source of danger, for the leaders, crowded upon by those that followed, even if they saw peril in front of them, could not stop, and often could not even turn aside, but were constantly forced on to a danger that they would gladly have avoided. This is the entirely simple explanation of a characteristic often wondered at by writers about this species; that is, their habit of running headlong into danger, — plunging over cut banks into the pens prepared for them by the Indians, or rushing into quicksands or places where they mired down, or into deep water, which might have well been avoided, or even up against such obstacles as a train of cars or a steamboat in the

river. The simple fact is that the animals which saw the danger were unable to avoid it on account of the pressure from behind, and those that were pressing the leaders on were ignorant of the danger toward which they were rushing.

I have already adverted to the popular but erroneous belief that the buffalo performed extensive migrations in spring and fall. This is not true. There were, unquestionably, certain seasonal movements east and west, and north and south, yet these movements were never very extended, and constituted nothing more than the very general shiftings which are made by many ruminants between a summer and a winter range. Throughout the country lying between the Saskatchewan and the Missouri River, the buffalo, in summer, moved up close to the mountains and even into the foot-hills; and at the coming of winter, with its snows and its bitter winds, they moved to the eastward again, seeking the lower ground and such shelter as the ravines and buttes and timbered river valleys of the prairie might afford.

On the other hand, buffalo, in their journeys to water, usually travelled to the nearest streams, and as on the plains the streams usually run from west

to east, and the buffalo travelled in single file, their trails ran at right angles to the course of the rivers, or north and south. It is quite possible that the directions of these trails, deeply worn, and showing the passage of great numbers of animals, may have given rise to the popular belief in this north and south migration.

At the same time, it is true that the buffalo herds were more or less constantly in motion. As they were very numerous, it was obviously essential that they should move constantly, to reach fresh grazing grounds. Often, too, they were disturbed by hunters, red or white, who stampeded the herds, which then rushed off in a close mass, perhaps not to stop for ten or a dozen miles. Besides that, frequently, the prairie was burned, so that they were deprived of food, and long journeys must be made to reach fresh grazing grounds.

Not very much is known, and very much less has been written concerning the tendency in animals, wild and domestic, to confine themselves to particular localities; yet all people who live much out of doors understand, even though they may not reason much about it, how very local in habit many birds and animals are. The ranchman, of

PROTECTED

course, knows that the horses and cattle which feed on his range divide themselves up into little bunches, each of which selects some special area where they spend all their time, rarely moving far from it, except to make journeys to water; or, at some change of the seasons, to migrate from summer to winter range or back again. In domestic stock this attachment to locality is strongly marked, and it is a common thing for animals that have been driven to a range hundreds of miles distant from that on which they have been accustomed to feed, to travel back toward their old haunts as soon as they are turned loose. I have known cases where one-third of a large bunch of horses, driven to a new range four or five hundred miles away, were a year later gathered again on their old home range. It is a matter of common experience for horses that escape from owners, travelling at a distance from the home range, to take the back trail and return to it.

Among our larger game animals a similar condition of things prevails. White-tail deer are greatly attached to particular localities, and when undisturbed, confine their wanderings within very narrow limits. Even if thoroughly fright-

ened, and driven to a considerable distance, they soon return. If an old white-tail buck is run with dogs, he may make a long chase, and cover a wide stretch of country, but to-morrow he will probably be found in his old home. In the same way, mule deer, mountain sheep, white goats, and antelope show their attachment for localities, and unless persistently disturbed, wander but little.

The same thing is true with regard to non-migratory birds. Ruffed grouse attach themselves to certain pieces of woodland, or to particular swamps, and the birds may be found there all through the season. In like manner, quail establish themselves on certain small pieces of ground, and after their haunts have been learned, may be started there with unfailing regularity.

During many years' experience with big game, I have often had these facts thrust on my attention, and have seen much to warrant the belief that, like other wild animals, the buffalo feels attachment for a particular range of country, which it does not desert except for good reason, or when the change from summer to winter, or back again, leads to a migration that may fairly

be called seasonal. The buffalo's attachment to locality, and its natural inertia, is well exemplified by an experience of Major G. W. H. Stouch, U.S.A., retired, a veteran soldier of more than thirty-five years' experience on the plains, of which he told me many years ago. I give it as nearly as possible in his own words: —

"In the fall of 1866 I was directed to proceed with Company C, Third Infantry, to reëstablish old Fort Fletcher on the north fork of Big Creek, sixteen miles below the present Fort Hays, Kansas. When on October 16th we marched down to the site chosen, and went into camp, I noticed half a mile above us on the creek bottom a considerable herd of buffalo feeding; there were perhaps eight or nine hundred of them. As soon as I saw them, it occurred to me that I would leave them undisturbed, and that so long as they remained there they might furnish us a supply of beef at very little cost of time or trouble. I therefore ordered the men not to hunt up the creek, or disturb these buffalo in any way, instructing them to do all their hunting down the stream.

"In order to put my idea in practice at once, I detailed one of the soldiers as hunter and

butcher of the company, and told him to go up the creek and kill a buffalo, but not to show himself either before or after firing the shot — merely to kill a fat cow and then to remain under cover until I joined him with a wagon. He did so. At the report of the rifle the buffalo fired at ran a few steps, and then lay down, while those nearest to it made a few jumps, looked around, saw no one, and then went on feeding. From the camp we were watching the result of the shot, and as soon as fired, I went with a wagon to bring in the meat. As the wagon approached the carcass, the nearest buffalo moved out of the way, without showing any special fear, and the wagon returned to camp with its load. This was repeated daily, the buffalo never being frightened either by the shot or the wagon, and seeming to become more tame as time went on, often approaching within a few hundred yards of where we were at work erecting the buildings.

"About November 1st, Troop E, Seventh Cavalry (under Lieutenant Wheelan) arrived to reinforce the post; and about November 19th Company B, Thirty-seventh Infantry (under Lieutenant Phelps) also arrived. I explained my plan of operation to these officers, and requested

them to detail hunters from their companies, and to order their men to hunt down the creek, and not to disturb what I had come to regard as the post beef herd. They did so, and the herd still remained with us.

"One morning in February, '67, a sergeant, whom I had sent the day before with a small detail to make a scout, rapped at my door, and reported his return. Among other things, he said: 'Lieutenant, I met our buffalo herd travelling up the creek, about fifteen miles from here. They were moving slowly; just feeding along.'

"I determined to see if they could not be brought back, and taking twenty-five men (accompanied by Lieutenant Cooke, Third Infantry, Adjutant, Assistant-Surgeon Fisk, and Mr. Hale, the post trader) rode up the creek, and entered the valley above the herd. Then, forming a skirmish line across the bottom, we very slowly advanced toward the buffalo. When they first noticed us, the leaders seemed uncertain what to do; but as they had been accustomed to seeing large parties of us, instead of running, as I feared they might, they at length turned about and began slowly to work backward in the direction from which they had come. By nightfall the herd was on its old

feeding ground, and there we left it, and there it remained until spring, and would, no doubt, have remained longer, but, unluckily, the Seventh Cavalry, under General Custer, rode in upon it, as they came down the creek to the post for supplies, after their unsuccessful chase after the Cheyennes, who had run away from General Hancock. General Custer detailed two troops with orders to secure meat for the command. After chasing it, and killing forty-four head, the herd was scattered, and never returned. The herd supplied the post (consisting of about three hundred officers and men) with fresh beef from October 16, 1866, until about April 20, 1867."

The buffalo calf, when captured very young, was easily tamed. Indeed, nothing more was needed at times than to permit the calf to suck the fingers for a moment or two, when it would follow the rider into camp, and seemed to be wholly without fear of man. As already stated, when very young it is hidden by its mother, and, like the young of deer, elk, antelope, and other ruminants, it can then be captured, and makes no effort to escape. This, by many writers, has been denounced as stupidity and dulness. As a matter of fact, it is merely following out the

protective instinct which is common to the young of many large mammals, at a time when they are without weapons for self-protection, and without strength or speed to save themselves by flight.

At various times during the last two hundred years, attempts have been made to domesticate the buffalo, and with entire success. But these attempts have never been continued long enough to be productive of any economic results. Nevertheless, buffalo were kept in captivity from the beginning of the eighteenth century, and toward the end of that century were actually domesticated, bred, and crossed with domestic cattle in Virginia, and somewhat later in Kentucky. The very full account given to Mr. Audubon by Mr. Robert Wycliff, of Lexington, Kentucky, in 1843, has often been quoted, and all the experiments since made have confirmed the conclusions then stated. It was proved, and is now well known, that the buffalo, in domestication, are easily handled, respect fences, and are but little more difficult to control than domestic cattle; that the male buffalo crosses readily with the domestic cow; that the progeny of the two species are fertile with either species and among themselves. It has also been demonstrated that the cross-bred

animal is larger than either parent, and so makes a better beef animal. Besides, its hide yields a robe which, if not equal to that of the buffalo, is, at least, vastly superior to the hide of the ordinary beef. More important than either the beef or the robe, is the very greatly increased hardiness of the cross-bred animal, which enables it to endure extremes of cold and snow, which would destroy the ordinary domestic cattle.

From the days of Robert Wycliff, almost to the time when Mr. C. J. Jones, of Kansas, began experiments in breeding buffalo, little or nothing had been done in this direction. A few years earlier Mr. S. L. Bedson, of Stony Mountain, Manitoba, set to work at the same problem, and both men met with abundant measure of success. Both bred pure buffalo in considerable numbers, and both succeeded in breeding the buffalo with the domestic cow, and securing a progeny which was remarkable for size and for the robes produced. Indeed, Mr. Hornaday quotes Mr. Bedson as saying that the three-quarter bred animal produces "an extra good robe which will readily bring forty to fifty dollars in any market where there is a demand for robes."

It is altogether possible that the time for

establishing a race of buffalo cattle has past. The buffalo are extinct, and the number of animals in captivity to be drawn on, very small. Nevertheless, the great preponderance of bulls among these domesticated buffalo, makes it possible that something in this direction might be done, though the chances now are much against it.

The buffalo has often been broken to the yoke. Robert Wycliff says of this animal, "He walks more actively, and I think has more strength than an ox of the same weight. I have broken them to the yoke and found them capable of making excellent oxen; and for drawing wagons, carts, or other heavily laden vehicles on long journeys, they would, I think, be greatly preferable to the common ox." Under the yoke, however, they are said to be somewhat difficult to control, and cases are cited where broken buffalo have, for various causes, run away, to the great detriment of the load they were hauling. In the year 1874 a settler on Trail Creek, in Montana, told me that he had a pair of bulls broken to the yoke, and declared that they would haul more than "any two yoke of cattle on the place."

There is another reason besides the lack of buffalo for thinking that no systematic attempt

to cross these animals with domestic cattle will ever be attempted. The days of free ranging, where the cattle are turned out on the prairie to look after themselves, winter and summer, are almost over, and year by year the area of the free range is becoming more and more contracted. The advantages of great size and a valuable robe would still be an attraction to the farmer; but the hardiness which enables the half-breed animal to endure almost any winter weather will soon cease to be required, because the cattle of almost all the western country will be kept under fence, and fed on hay during the winter.

From time immemorial the buffalo furnished food to the Indians, and with the coming into the land of the white man it supported him also. What the primitive method was by which the Indians hunted buffalo we do not know, but at the time the redmen became known to the whites, when they were footmen, the only method of securing this animal was by the surround, or by driving it into pens from which the buffalo could not escape, and where they were easily destroyed. Such pens were built at the foot of cut bluffs or low cliffs, over which the buffalo were driven; or, in the more open and

flat country, where ravines with steep sides were not found, a long fenced causeway was often built, on which the buffalo were driven, and when reaching its end, the leaders, by reason of the pressure of those behind, were forced to jump into the pen, and the others followed, until all were captured. Often, if the drive was made over a high bluff, the fall killed many of the beasts, and even when this did not take place, many of the younger and weaker animals were destroyed by their fellows in the tremendous crush which took place within the pen.

No sooner did the buffalo find themselves confined, than they began to race about the enclosure, and the men standing on the logs which formed its sides, shot them with their stone-headed arrows as they ran by, until at length all had fallen.

The principle of the foot surround was not different from this. When a herd of buffalo was found, the Indians waited for a day when the wind did not blow, and then, creeping toward the buffalo, they surrounded them on all sides. When the line was fairly complete, one man would show himself, and perhaps frighten the buffalo by waving his robe at them. They

would start to run, when the men stationed at the point of the circle toward which they were directing their course would show themselves, toss their robes in the air, and turn them in another direction. Thus, whichever way they ran, they found people standing before them, and soon they began to run around in a circle within the ring of men, and continued to do this until they became exhausted. Little by little the men drew closer together, making the circle smaller, and soon the buffalo were running near enough to them for them to be shot by their arrows.

It did not always happen that the hunt was successful. Sometimes in the pen a strong bull might find a place where no one was standing, and might leap over the barrier, or at least leap on it, throwing his whole weight against it. Very likely he would be followed by others, and perhaps a number would succeed in surmounting the wall; or they might even break it down, and then the whole herd would stream out of the pen and be lost. Sometimes, too, in the surround, especially if the herd of buffalo was large, it was found impossible to turn them, and they would break their way through the ring of men. In like manner, when, as sometimes happened, the

Indians set up their lodges all about the herd, the buffalo might yet find a way to break through and escape.

If, however, all went well, and a good part of the herd was killed, there was great rejoicing all through the camp. Everybody was happy, since now, for some days, food would be abundant, and every one would have enough to eat; and there is nothing that the Indian dreads so much as hunger.

Later, after the Indians obtained horses and iron-pointed arrows, and, later still, repeating rifles, these old methods were all given up. It was easier to chase the buffalo on horseback, and their packhorses gave them a ready means for bringing the spoils of the chase back to the camp. Now, too, they used the lance in hunting, driving the horse close up on the buffalo's right side, holding the lance across the body, and, with a mighty two-handed thrust, sending the keen steel deep into the animal's vitals.

Perhaps no more exciting scene could be witnessed than one of the old-time buffalo chases by the Indians. Naked themselves, they rode their naked horses, carrying their quivers of arrows on their backs or by their sides, and their bows in

their hands. The good buffalo horses were swift of foot to catch the cow, admirably trained for running over the rough prairie, often dangerous from badger holes or burrows of the prairie dog, and knowing how to approach the buffalo, and also how to avoid its charge — trained, in fact, just as well as the cow-pony is trained, which knows exactly what is expected of him when he is cutting cattle out of a bunch. The chase was conducted in silence, and the only sound heard was the rumble of a thousand hoofs — dull where the ground was soft, and sharp if it hardened. If the herd was large, the scene was one of great confusion. Buffalo and horses with their riders were dimly seen amid the cloud of dust thrown up by the fleeing herd. Horses were constantly overtaking the buffalo, riders were bending down, horses were sheering off, buffalo were falling. The old bulls, passed by the swift riders, were turning off and fleeing, singly or in little groups, to right and to left, while the swifter cows, with heads down and tails in air, were pressing forward in flight to escape the Indians, who were riding with their rearmost ranks.

Not greatly differing from this, save that guns were used and there was much yelling and noise,

were the hunts of the wild Red River half-breeds. These were pursued on horseback, and the men were armed with the old Hudson Bay smooth-bore flint-lock guns. Powder was carried in a horn and balls in the mouth. When he had discharged his gun, the hunter poured the powder from the horn directly into the barrel, guessing at the quantity, slipped a ball from the mouth into the barrel, the gun was given a jar on the saddle to settle the load, a little priming was poured into the pan, and he was ready for another shot.

On such hunts the Red River half-breeds transported their families and their property almost entirely in the well-known Red River carts, each drawn by a single horse, and containing, besides a load of baggage, a woman and perhaps two or three children.

Besides these wholesale methods of taking buffalo, of course they were killed singly by men who crept close enough to them to drive even a stone-headed arrow deep enough into the sides to reach the life. Often, when the buffalo were in situations where it was impossible to approach them, men disguised as wolves crept in among the herd, and killed buffalo with their arrows.

Catlin and others have described and figured this method of approach, which at the present day is traditional only among the Indians; yet an old friend, who died a few years ago, almost a hundred years old, has told me that he had many times killed buffalo in this way, either alone or in company with some Indian friend.

Indians and half-breeds alike preserved the flesh of the buffalo by drying it. The strips or wide flakes of meat were cut about one-quarter of an inch thick and hung on scaffolds exposed to sun and air. In a day or two the meat was thoroughly dried, when it was bent into proper lengths, and either tied in bundles or done up in parfleches. It was from this dried meat that the well-known pemmican was made. The dried meat was roasted over a fire of coals, and then broken up by pounding with sticks on a hide, or by pounding between two stones. This pulverized flesh was mixed with the melted fat of the buffalo, and after the whole mass had been thoroughly stirred, was packed in sacks made of buffalo skin, which were then sewed up with sinew, and as the mass gradually cooled the sack became hard, and would keep for a very long time.

The killing of buffalo, as described, was in no sense sport; instead, it was work of the hardest kind. The swift ride over the dry plains through the clouds of dust, the killing of the buffalo, and finally the cutting up of the animals was physical labor far harder than most of that performed by civilized man. Usually, the buffalo were killed far from water, and the severe work that the man had been doing and the summer heat made him very thirsty. It is not strange, then, that he slaked his thirst by devouring the liver, sprinkled with gall, or by eating raw the gelatinous nose of the buffalo.

The description of a butchering, given by Audubon in his "Missouri River Journal," is very graphic, and is worth quoting here: —

"The moment that the buffalo is dead, three or four hunters, their faces and hands often covered with gunpowder, and with pipes lighted, place the animal on its belly, and, by drawing out each fore and hind leg, fix the body so that it cannot fall again; an incision is made near the root of the tail, immediately above the root in fact, and the skin cut to the neck, and taken off in the roughest manner imaginable, downward and on both sides at the same time. The knives

are going in all directions, and many wounds occur in the hands and fingers, but are rarely attended to at this time. The pipe of one man has perhaps given out, and with his bloody hands he takes the one of his nearest companion, who has his own hands equally bloody. Now one breaks in the skull of the bull, and with bloody fingers draws out the hot brains and swallows them with peculiar zest; another has now reached the liver, and is gobbling down enormous pieces of it; while perhaps a third, who has come to the paunch, is feeding luxuriously on some — to me — disgusting-looking offal. But the main business proceeds. The flesh is taken off from the sides of the boss, or hump bones, from where these bones begin to the very neck, and the hump itself is thus destroyed. The hunters gave the name of 'hump' to the mere bones when slightly covered by flesh; and it is cooked, and is very good when fat, young, and well broiled. The pieces of flesh taken from the sides of these bones are called *filets*, and are the best portion of the animal when properly cooked. The forequarters, or shoulders, are taken off, as well as the hind ones, and the sides, covered by a thin portion of flesh, called

the dépouillé, are taken out. Then the ribs are broken off at the vertebræ, as well as the boss bones. The marrow-bones, which are those of the fore and hind legs only, are cut out last. The feet usually remain attached to these; the paunch is stripped of its covering of layers of fat, the head and backbone are left to the wolves. The pipes are all emptied, the hands, faces, and clothes all bloody, and now a glass of grog is often enjoyed, as the stripping off the skin and flesh of three or four animals is truly very hard work. . . . When the wind is high, and the buffaloes run toward it, the hunters' guns often snap, and it is during their exertions to replenish their pans that the powder flies and sticks to the moisture every moment accumulating on their faces; but nothing stops these daring and usually powerful men, who, the moment the chase is ended, leap from their horses, let them graze, and begin their butcher-like work."

The Indian and the half-breed killed the buffalo for their support, — for food, clothing, shelter, and many of their implements. The civilized buffalo skinner exterminated it for its hides. There was another class which did something toward wiping out the buffalo, yet the numbers

killed by them were inconsiderable in comparison with those killed for commercial purposes. This class comprised those who ran buffalo for sport. Buffalo-running was not a difficult art, nor especially exciting, except so far as it is exciting to chase and overtake some creature that is trying to escape. Provided a man had a good horse and was fairly accustomed to riding, there was little difficulty and little danger in the buffalo chase. At the same time, the combination of the swift ride, the rough country, the dust and dirt thrown up by the flying herd, and the close proximity of the great beasts have reduced many a buffalo runner on his first chase to a pitch of nervousness which made him do precisely the wrong thing. There have been cases, not a few, where riders, trying to kill buffalo with a pistol, have shot their own horses instead of the buffalo; and at least one case came to my knowledge where the excited hunter, riding up on the right instead of the left side of the bull, and shooting across his own body, managed to shoot himself in the left arm.

There was something rather exhilarating in the headlong ride after buffalo, a game not unlike "follow my leader," which boys play, where

the leader chooses the roughest and most difficult ground over which he can pass, and the follower is obliged to take the same route. But buffalo-hunting is now a sport of the distant past, and it is needless to speak of it at any length.

In the days of its abundance the buffalo was a most impressive species, and their enormous numbers have been a theme on which many writers have delighted to linger. Adjectives have failed them to describe the multitudes of buffalo seen, and it was not unusual for men to travel long distances among great herds, which made slow way for them as they passed along. Many calculations have been made of the numbers of buffalo seen at one time; but, after all, these can be little more than guesswork. Terms like thousands and millions, so commonly used, have little or no meaning, for we have no standard of comparison by which to measure them. All the earlier writers, however graphic their descriptions of their numbers, fail to impress the reader, because no one could comprehend such numbers except by seeing them. Dr. Allen, Mr. Hornaday, Colonel Dodge, and many of the old explorers, give much matter bearing on this subject. A few lines from the Journal of Alexander Henry

give some idea of their numbers on the Red River. He says, under date of September 18, 1800: "I took my usual morning view from the top of my oak, and saw more buffalo than ever. They formed one body, commencing about half a mile from camp, whence the plain was covered on the west side of the river as far as the eye could reach. They were moving slowly southward, and the meadow seemed as if in motion. This afternoon I rode a few miles up Park River. The few spots of wood along it have been ravaged by buffalo; none but the large trees are standing, the barks of which are rubbed perfectly smooth, and heaps of wool and hair lie at the foot of the trees. The small wood and brush are entirely destroyed, and even the grass is not permitted to grow in the points of the wood. The bare ground is more trampled by these cattle than the gate of the farm yard."

Even in recent times one might journey for days at a time through herds, which to the eye seemed absolutely to cover a blackened prairie, and I myself have travelled for weeks through the Northwest without, at any time during the day, being out of sight of buffalo. How many millions there were in the great herds through which we

used to pass, it is useless now to compute. They have all gone. But over a vast extent of the western country they have left memorials still visible and long to endure in the deep trails which furrow the prairie in all directions.

Other mementos still to be seen, and stirring the heart of the old-timer, though to the man of to-day they are without a meaning, are the huge erratic boulders which lie here and there over the prairie where they were dropped by the great ice mass in its passage down from the highland. Against such boulders the buffalo used to rub their bodies, and such masses of granite or of flinty quartzite, polished and with their sharp angles worn away by the rubbing against them of the tough hides, may often be seen. About such a rock, deep worn in the ground, is the trench, where the bulls and the cows and the younger animals once marched as they pushed their sides against the hard rock, their hoofs cutting the soil into fine dust to be blown away by the wind. The angles of these old rubbing-stones are still discolored by the grease left on them from the buffalo's skins, and looking at them, one might fancy that they had been used only yesterday.

Here, then, are monuments of imperishable granite, fashioned by a race of dumb creatures, and telling to him who can read their sculpturing a long story of life and power and multitude forever gone. From earliest time man has set up all over the earth his enduring memorials to hold the wonder of later ages; but of the races of the beasts, which one has done this, save only the bison?

AMERICAN BISON

(Bos bison[1])

The great elevation of the fore quarters, the mass of long hair clothing the head, shoulders, and fore part of the body, together with the peculiar form of the head and horns, the latter of which are cylindrical, serve at once to distinguish the bison from the other members of the ox tribe. Some of the points distinguishing the American bison from its European cousin are that the mass of hair on the fore quarters is longer, the form of the skull is different, the horns are shorter, thicker, blunter, and more sharply curved. In the skull of the American animal the sockets of the eyes have a more tubular form.

Height at shoulder about 6 feet; weight from 15 to 20 hundredweight; an adult bull weighed by W. T. Hornaday scaled 1727 pounds.

Distribution. — The greater portion of western North America, ascending to the Great Slave Lake, and descending to New Mexico and Texas; now nearly exterminated. American writers recognize two races (or species), the prairie bison (*B. bison typicus*) and the larger wood bison (*B. bison athabascæ*) of the forest highlands of the northwest.

[1] "Records of Big Game," Rowland Ward, third edition.

MEASUREMENTS OF HORNS

LENGTH ON OUTSIDE CURVE	CIRCUMFERENCE	TIP TO TIP	WIDEST INSIDE SPREAD	LOCALITY	OWNER
—21½	15¼	..	35 outside	Northern Montana	W. F. Sheard
20⅞	15	..	30½	Wyoming	Hon. F. Thellusson
—20¼	16⅛	33½	..	?	W. H. Root
—19	12½	..	..	Western Montana	P. Liebinger
18⅞	14¾	..	16⅞	Western Montana	The late J. S. Jameson
—18¼	14	26¼	29	Sioux Country	Sir Greville Smyth, Bart.
—18	14	..	..	Montana	F. Sauter
17¾	12⅜	15⅛	..	?	H.R.H. the Duke of Saxe-Coburg and Gotha
—17½	12½	..	..	Southwestern Montana	Theodore Roosevelt
17½	12	..	25½	Wyoming	H.R.H. le Duc d'Orléans
17½	13½	21	..	?	Viscount Powerscourt
17⅛	11⅜	10⅜	17⅛	?	British Museum
—17	14	17½	..	Yellowstone, Montana	Count E. Hoyos
16⅝	14¼	24	..	Bighorn Mts., Wyoming	Moreton Frewen
[1]16½	12½	19⅜	..	Colorado	Sir Edmund G. Loder, Bart.
16¼	13½	14¼	..	?	Duke of Portland
16⅛	15⅞	25¾	..	Colorado	Sir Edmund G. Loder, Bart.
15½	14⅜	..	19¾	Wyoming	St. George Littledale
—15.8	12.14	15	..	Indian Territory, near Texas	Prince Henry of Liechtenstein
14	..	12¼	..	North Park, Colorado	Col. Ralph Vivian
13½	13½	17½	..	?	G. Wrey
13⅜	12	..	..	?	Hon. Walter Rothschild

[1] Wood Bison.

THE MOUNTAIN SHEEP: HIS WAYS

By Owen Wister

ROCKY MOUNTAIN SHEEP

THE MOUNTAIN SHEEP: HIS WAYS

Upon a Sunday morning, the 10th of July 1892, I awaked among my scanty yet entangling Pullman blankets, and persuaded the broken-springed window-shade of my lower berth to slide upward sufficiently for a view of Livingston, Montana. Outside I beheld with something more than pleasure a fat and flourishing mountain ram. He was tethered to a telegraph pole, and he scanned with an indifference bred by much familiarity our sleeping-car, which had come from St. Paul, being dropped last night from the coast-bound train, because it was this morning to trundle its load of tourists up the Yellowstone Park branch to Cinnabar. The ram had been looking at Eastern tourists and their cars long enough for the slow gaze of his eye to express not a kindred but the same contempt which smouldered in the stare of the Indians at Custer station, of the cow punchers

at Billings, of every Rocky Mountain creature, indeed, beneath whose observation the Eastern tourist passes. Dear reader, go stand opposite the lion at the zoo if you don't know what I mean. So patent was the stigma cast that it fantastically came into my head to step down and explain to the animal that I was not a tourist, that I had hunted and slain members of his species before now, and should probably do so again. And while thus I sat speculating among the Pullman blankets, the ram leaped irrelevantly off the earth, waved his fore legs, came down, ran a tilt at the telegraph pole as though at a quintain, and the next instant was grazing serene on the flat with an air of having had no connection whatever with the late disturbance.

What had started him off like that? Extreme youth? No; for when I came to hear about him, he was five years old — a maturity corresponding in us men to about thirty. It was simply his own charming temperament. No locomotive had approached; moreover for locomotives he, as I was later to observe, did not care a hang; no citizen old or young of either sex had given him offence; nor was there stir of any kind in Livingston, Montana, this fine early

Sunday morning. When I presently stood on the platform, only the wind was blowing down from the sunny snow-fields, and that not bleakly, while from high invisible directions came thinly a pleasant tankling of cow-bells.

Not two minutes had I been on the platform when the ram did it again. Yes, it was merely his charming temperament; and often since, very often, when encompassed with ponderous acquaintance, have I envied him his blithe and relaxing privilege. I was now thankful to learn that the branch train had still some considerable time to wait for the train from Tacoma, before it could take me from the ram's company; no such good chance to watch a live healthy mountain sheep on his own native heath was likely again to be mine, and after breakfast I sought his owner at once.

"It's a fine dy," said the owner.

"And a very fine ram," I assured him.

"He's quite tyme," the owner went on. "You can have him for five hundred."

"You're a long way from London," was my comment; and he asked if I, too, were English. But I was not, nor had I any wish to bear away the ram, skipping and leaping into civilization.

Three hundred pounds would, I suppose, have been a little heavier than he was, but not much; he stood near as high as my waist, and he had at some period of his long, long ancestry marched across to us from Asia upon his lengthy un-sheeplike legs — skipped over the icy straits before Adam (let alone Behring) was in the world, and while the straits themselves waited for the splitting sea to break the bridge of land between Kamchatka and Alaska. This is the best guess which science can make concerning our sheep's mysterious origin. Upon our soil, none of nature's graveyards hold his bones preserved until late in the geological day; earlier than the glacial period neither he nor his equally anomalous comrade, the white goat, would seem to have been with us; and we may comfortably suppose that sheep and goat took up their journey together and came over the great old Aleutian bridge which Behring found later in fragments. Having landed up there in the well-nigh Polar north, they skipped their way east and south among our Pacific and Rocky Mountains, until, by the time we ourselves came over to live in the North American continent, they had — the sheep especially — spread themselves

widely, and were occupying a handsome domain when we met them.

"Among other things we procured two horns of the animal . . . known to the Mandans by the name of ahsahta . . . winding like those of a ram."

This, so far as I know, is the first word of the mountain sheep recorded by an American. Thus wrote Lewis on December the twenty-second, 1804, being then in winter camp with the Mandan Indians, not many miles up the river from where to-day the Northern Pacific's bridge joins Bismarck to Mandan. We find him again, on the twenty-fifth of the May following, when he has proceeded up the Missouri a little beyond the Musselshell, writing, "In the course of the day we also saw several herds of the big-horned animals among the steep cliffs on the north, and killed several of them;" as to which one of his fellow explorers correctly comments in his own record, "But they very little resemble sheep, except in the head, horns, and feet." It is not worth while to quote a later reference made when the party was near the Dearborn River, north, sixty miles or so, of where now stands the town of Helena.

Thus it is to be seen that Meriwether Lewis, private secretary to President Jefferson and commander of that great expedition, met the mountain sheep in Dakota, and from there to the Rocky Mountains grew familiar with him; though not so familiar as to prevent his later making a confusion between sheep and goats, which, being handed down, delayed for many years a clear knowledge of these animals. To this I shall return when goats are in question.

Until very lately, until the eighties, that is to say, sheep were still to be found in plenty where Meriwether Lewis found them among the Bad Lands of Dakota; and they dwelt in most ranges of the Western mountains from Alaska to Sonora. They had not taken to the peaks exclusively then; the great table-land was high enough for them. I very well recall a drive in July, 1885, when, from the wagon in which I sat, I saw a little band of them watching us pass, in a country of sage-brush and buttes so insignificant as not to figure as hills upon the map. That was between Medicine Bow and the Platte River. To meet the bighorn there to-day would be a very extraordinary circumstance; and as for Dakota,

ALERT — (*Ovis stonei*)

there too has civilization arrived; and you will find divorces commoner than sheep — and less valuable.

It is Gass whom I have cited above as to the scant likeness between this wild so-called sheep and the usual sheep of our experience; and it was Gass whose word I remembered this Sunday morning at Livingston, while I stood taking my fill of observation. The ram, as his owner had assured me, was in all truth quite "tyme"; and you could examine him as near as you wished. I took hold of his rope and pulled him to me, and rubbed his nose. Like a sheep? I have already spoken of his long legs. I now looked him over carefully for a sign of anything in the nature of fleece. There was no sign. Short hair, in texture not unlike the antelope's and in color not far from that gray we see in fishing-line, covered him close and thick. Upon his neck and shoulders it merged with a very light reddish brown, and on his rump it became a patch much lighter, though not white. In fact, the hue of his coat varied subtly all over him; and I am tempted to remark in this connection that in describing the color of wild animals most of us have been apt to make our assertions far

too rigid. Animals there are, of course, completely white, or black, and so forth; but many, the more you scrutinize them, the more reveal gradations, as this ram did; gray fishing-tackle is only a rough impression of his tint upon the 10th of July; on December the 1st of that same year I saw him again, and his hair had darkened to something like a Maltese cat's. Furthermore, I have seen other sheep in summer that struck me, some as lighter, and some as darker, than the gray of fishing-tackle. And what, shall we infer, do these variations import? Adjustments to climate and environment, state of the individual's age and health, or several distinct species of sheep? I think I should be shy of the last inference unless I were prepared to accept a difference in the color of the eyes and hair of two brothers as being a basis sufficient to class them as separate subspecies of man. It is a dear thought to many of us that some mountain, some lake, some river, some street, or even (rather than nothing at all) some alley, shall be labelled with our name, and thus bear it down the ages; and from this very human craving our zoölogists are not wholly exempt; but I have been taught to doubt that of the mountain sheep, the *Ovis cana-*

densis[1] (or *Ovis cervina*, as some books still have it), more than one or two subdivisions will prove, in the end, valid enlargements of our knowledge. These are *Ovis dalli*,[2] a white variety in central Alaska, north of latitude 60°, and (perhaps) *Ovis stonei*,[3] a dark variety with horns more slender and outward curving, in Alaska and North British Columbia. The four other would-be subspecies have been set down as *Ovis canadensis auduboni*, *Ovis nelsoni*,[4] *Ovis mexicana*,[5] and *Ovis*

[1] Dark brown, shading to tan and ecru, tinged with grayish blue; large, heavy boned; massive horns curved close to head, well flattened, deeply corrugated on upper rim, usually battered at the points in the older rams. Range the Rocky Mountains north from the Colorado River to the head waters of the Peace River, British Columbia. Range in upper edge of timber line.

[2] White. Summer coat of a rusty hue. Not so large as *Canadensis*. Horns white, curved well away from head; not so deeply corrugated, less massive than *Canadensis*. All of Rocky Mountains north of 60° N. L., and Alaskan Mountains in Western Alaska Range, above timber line.

[3] The darkest of all the sheep, shading from light to very dark gray tinged with brown. Horns long and graceful but slender, spreading farther from the head than those of any species. Range the Rocky Mountains between 55° and 60° N. and in the Cassiar, Campbell, and Simson mountains farther west and north to 62° N.

[4] Light brown to ecru tinged with drab. Horns similar to *Canadensis*. Range the semi-desert country in Southern states from Texas to California.

[5] Darker than *Nelsoni*, but not so dark as *Canadensis*. Size large. Horns broad and massive; molar teeth larger than in any known American sheep; tail vertebra long. Range Chihuahua Mountains in Northern and Western Mexico.

fannini.[1] These four may be considered not so much varieties of sheep as works of fiction.

As to the general name, all are agreed to let him pass conveniently as a sheep, — conveniently, but with a number of reserves which science can state. He has, for instance, some things in common with the goat family. Indeed, science can, in final analysis, hardly separate sheep from goat. Relatives in this continent our *Ovis* possesses absolutely none; but there are cousins to be found in Kamchatka, Tibet, and India; and I have been told by one hunter that the moufflon of Corsica resembles him not a little. I've forgotten to mention that he hasn't any tail to speak of. So now at length, you, who have never looked upon him, see him, if you can, through my unscientific vision, as I rubbed his nose at Livingston, Montana: tall almost as a deer, shaped almost like a heavy black-tail deer, close haired, grayish, tailless, with unexpected ram's horns curving round his furry ears and forward, with eyes dark yellow and grave, and with the look of a great gentleman in every line

[1] White and gray. In size about that of the *Dalli* and *Stonei*. Horns white; curved closer to head than *Dalli* and *Stonei*. Range Upper Yukon River. Range more in the timber than *Stonei* or *Dalli*; habits very much those of *Canadensis*.

of him. The tame sheep is hopelessly *bourgeois;* but this mountain aristocrat, this frequenter of clean snow and steep rocks and silence, has, even beyond the bull elk, that same secure, unconscious air of being not only well bred, but *high* bred, not only game but *fine* game, which we still in the twentieth century meet sometimes among men and women. What gives distinction? Who can say? It is to be found among chickens and fish. What preserves it we know; and our laws will in the end extirpate it. Many people already fail to recognize it, either in life or in books. But nature scorns universal suffrage; and when our houses have ceased to contain gentlefolk, we shall still be able to find them in the zoölogical gardens.

During my interview with the sheep, freight trains had passed once or twice without disturbing him or attracting his notice; but as I walked away and left him grazing, there came by a switching-engine that made a great noise. This didn't frighten him, but set him in a rage. Once again he leaped into the air waving his fore legs and eccentrically descended to charge with fury his telegraph pole. Yes, he was "tyme," if by that word one is to understand that he was shy

neither of men nor locomotives; but just here there is a hole in our dictionary. Do you imagine that five years of captivity are going to tame the blood and the nerves of a creature that came over the Aleutian bridge from Asia during the Pleistocene, and has been running wild in the mountains until 1887? He was "tame" enough to pay you no attention — until he wanted to kill you; and this was what he did want when I saw him on the first day of the following December. Then was his rutting time; he was ready to attack and destroy with his powerful horns anything in Livingston; and so it was in a stable that I found the poor fellow, took a peep through the quarter-opened door, where his owner had shut him and tied him in the dark, away from his natural rights of love and war. I noted his winter coat of maltese, I heard his ominous breathing, I saw the wild dangerous lustre in his rolling eye; and that was my farewell to the captive.

So good a chance to study a live ram I have never had again. Upon the other occasions when I have been able to approach them at all, study has not been my object, and the distance between us has been greater; but on one happy later day,

I watched a ewe with her lamb for the good part of a morning.

In the summer of 1885, as I have said, the mountain sheep had not yet forsaken quite accessible regions in Wyoming; and very likely he still came down low in most of his old haunts. The small band which I saw was not many miles from one of the largest ranches in that country, and the creatures stood in full sight of a travelled road, — not at that time a stage-road, but one that might be daily frequented by people riding or people driving on their way north from Medicine Bow into the immense cattle country of the Platte and of the Powder River still farther beyond, all the way to the Bighorn Mountains. Those very mountains that bear the sheep's name and were once so full of sheep as well as of every other Rocky Mountain big game are now sacked and empty. Hidden here and there, some may exist yet, but as fugitives in a sanctuary, not as free denizens of the wild. I saw three years bring this change which thirty years had not brought; and in 1888 you would have looked in vain, I think, for sheep on the road from Medicine Bow to Fetterman. I found them that year at no such stone's throw from

the easy levels of the earth, but up in the air a great distance.

The Washakie Needle, for steepness, is truly a heartrending country, and that is why the sheep are there. In it rise Owl Creek, Grey Bull, and certain other waters tributary to the Bighorn; and I have never gone with pack-horses in a worse place. A worse place, in fact, I have never seen; though they tell me that where Green River heads on the Continental Divide (in plain sight from the Washakie Needle across the intervening Wind River country) you can, if you so desire, enmesh yourself, lose yourself among cleavages and cañons that slice and slit the mountains to a shredded labyrinth. From the edge of that rocky web I stepped back, discouraged, a year later; and for vertical effects the Washakie Needle remains, as they say, "good enough" for me. We struggled to it through a land of jumping-off places, a high, bald, bristling clot of mountains that, just beyond the southeast corner of the Yellowstone Park, come from several directions to meet and tie themselves into this rich tangle of peaks, ledges, and descents. You really never did see such a place! and my memory of it is made lurid by an adventure with

UNDER A HOT SKY — (*Ovis nelsoni*)

a thunder-storm which cannot be chronicled here because it happened on one of the days when we found elk, but most lamentably missed our sheep. Missing a sheep, let me say, is of all missing the most thorough that I know.

Encouragement, false encouragement, had come to us after our very first night in camp by the Washakie Needle. The next night we had wild mutton for supper. That initial day, Wednesday, August twenty-ninth, brought us this sweet luck, sweet not alone in its promise of more (for the country was evidently full of sheep), but almost equally because of late, during our perilous journey, we had come down to bacon. Now, to be a hunting party, to be in the Shoshone Mountains in August, 1888, and to be eating *bacon*, was to be humiliated; only our hard travelling that allowed no attending to other business could excuse such a bill of fare; hence did our pride and our stomachs hail this wild mutton. There was not much of him to hail: he was a young ram; and between six of us, after bacon . . . need I say more?

It had been my intention, until this very paragraph, to skip what happened next day. But I am growing confidential; these shall be the con-

fessions of a bad shot. I have read in books and in periodicals so many pages where none but good shots were ever fired; I have listened — merciful heaven! — to the tales of my sportsman friends; and, reader, unless you are not at all like me, you have read such pages too, have listened to such stories too, and you have found a monotony creep over these triumphs of other people, —the hair's-breadth climb, the noiseless approach, the long-range shot, one hundred yards, two hundred, five hundred, with sights not adjusted but elevation merely guessed at, and the inevitably unerring result; and in the midst of all this asphyxiating skill, you have sometimes longed for one pure, fresh breath of failure — have you not? Well, at all events you shall read of mine; and, besides variety, there is a second good reason for this; you could not better learn the ways of the mountain sheep, which, so far as I know them, I am attempting to tell you.

Four of us were so foolish as to set out together upon this evil morning; two parties, that is, of the guide and the guided. There is never any gain in doing this, and almost always loss. The attention which you should be giving to your business is divided by conversation, or by waiting

for some member of the party who has fallen behind; and no matter how silent you keep yourselves, four people are sure at some wrong moment to prove conspicuous; better hunt alone, unless circumstances make it wise that there should be two of you — steep country does make this wise — but assuredly never go after game in fours, as we two white men and two Indians went now. We labored and we labored and we finally were upon the top instead of at the bottom of something. It was no more than a ridge, not high, that everywhere dropped off into our own valley or the next one; but two sweating hours had gone in getting merely here, and here our eight eyes discerned sheep, quite a band of them. Not, however, before the sheep had discerned us four wily hunters. We did not know this then, because they stayed still where they seemed to be grazing. It was a great way off in a straight line through the air, for the sheep were small dots upon the mountain; and there was no straight line for us to reach them by. We labored and we labored down to a new bottom and upward on a new slope, and made a most elaborate "sneak," crouching, and stopping, and generally manœuvring among stones, gravel, and harsh tufts of

growth; so did we come with splendid caution upon where the sheep had been, and, lifting our heads, beheld the vacuum that they had left, and themselves contemplating us from the extreme top of the mountain. I am sure that you know how it feels to have your foot step into space at what you thought was the bottom of the staircase. There is a gasp of very particular sensation connected with this, and that is what I had now, followed at once by the no less distasteful retrospect of myself with my half-cocked rifle, crawling carefully for yards upon my belly, while the sheep watched me doing it. There they were on the top of this new mountain, away far above us, and we four hunters proceeded to go on wrong, as we had begun. I have forgotten to mention that, among our other follies, we had brought horses. Never do such a thing! If you are not in training good enough to hunt mountain sheep on your own legs, wait and climb about for a few days until you have got your breath. What my horse did for me on this precious day was this: our hills were too steep for him to carry me up, so I led him; they were too steep for him to carry me down, so I led him; and betweenwhiles, when I was stalking sheep, I naturally had to leave him

behind, and naturally had to go back for him when the stalk was over. You will have by this time but a middling opinion of my common sense; but please bear in mind that Shoshone Indians invariably hunt with horses, and that in those days I was still too much one of the "guided" to be equal to dictating to any Indian what trail we should go, and in what manner we should hunt. This entire hunt of 1888, from the distant Tetons and the waters of Snake River over to the Washakie Needle and Owl Creek, is a tale of struggle between ourselves and our red-skinned guides; we were beginning to know the mountains, to crave exploration, to try the unbeaten path; and for an Indian (though you would never suspect it until you suffered from it) the *un*beaten path is the one that he never wishes to try and will do all things to escape — even to deserting you and going home.

We hunters now set our legs to new laboring, and presently were again weltering in sweat, and could look down into a third valley similar to the two we had so painfully quitted. Down at the bottom of this new gash in the hills went a little stream like all the others, and beyond bristled interminably the knife-like intersections of the

mountains. We had placed our sheep behind a little rise along the summit, and between this and ourselves some three hundred yards still intervened. We were, of course, much above where any trees grew, and the ground was of that stony sort with short growth and no great rocks immediately near; a high, lumpy pasture of mounds and hollows, wet with snows but lately melted, hailed upon often, rained on but seldom. Lower down, this pasture country (which made the top of all but the highest and severest mountains) fell away in descents of gravel and sheer plunges of rock. To get closer to our sheep we now discovered we must go down some of this hill we had just come up; they were on the watch, but were fortunately watching the wrong place, and we all sat down in happy pride for a consultation. The other side of the hill had turned out suddenly to be a precipice, a regular jumping-off one, that went a long way and ended in a crumble of shifting stones, and then took a jump or two more and so reached the water at the distant bottom. This side was our only possible course, and we took another look at the sheep. They had given up watching, and in joy we started for them quickly. We had so skilfully chosen the ground for our

approach that we were screened by a succession of little rises and hollows which lay between us and the sheep. This time, this time, there was to be no crawling up to find a vacuum, no raising your head to discover the departed sheep taking a bird's-eye view of you! What the hearts of the other hunters did, I don't know, but my heart thumped with vindictive elation as we sped crouching among the little intervening hollows, perfectly hidden from the sheep and drawing close to them at last. Only one more rise and hollow lay between us and where they were pasturing; and over that rise we hastened straight into the laps of some twenty sheep we had known nothing about; they were all lying down. Neither had they known anything about us; the surprise was mutual. All round me I saw them rise, as it were, like one man and take to diving over the precipice. Bewilderment closed over me like a flood; all my senses melted into one blurred pie of perception in which I was aware only of hind legs and hopping. Frightful language was pouring from me, but I didn't hear what it was; all was a swirl and scatter of men and sheep. Not one of us hunters was ready with his gun or his intelligence. We

indiscriminately stampeded to the edge, and there went the sheep, hustling down over the stones, sliding, springing, and dissolving away. And now, suddenly, when it was of no use at all, we remembered that we carried rifles, and like a chorus in a comic opera we stood on the brow of the mountain, concertedly working the levers, firing our Winchesters into space.

It's all fifteen years ago; yet as I read over my relentless camp-diary, I blush in spite of laughter; it's hot work staring truth in the face! And now comes the last feeble pop of the ridiculous. We turned our heads, and beheld the sheep we had come for, the sheep we had climbed two mountains for, the sheep we had at length got within a hundred yards of, just disappearing over a final ridge so far away that there remained to them no color, and only one dimension — length. They looked like a handful of toothpicks. They naturally had not been idle while we were so busy; while we were losing our heads, they had kept theirs; and during that brief fusillade of ours — the whole preposterous affair could not have filled more than three minutes — they had put such a stretch of ups and downs between us, that going after them any more was not to be thought of.

We stood at the empty top of the mountain with our ruined day. There was not a live animal in sight anywhere. Those that jumped into the valley were lost among the pines, and warned about us beyond retrieve. We had banged away at such a rate up here that a wide circle of sheep must be apprised of our neighborhood. Why had we done it? For just the same reason that a number of brave persons ran away suddenly at Bull Run as if perdition were at their heels. Surprise, I take it, is at the bottom of the most unaccountable acts of men. And if you wonder why our two Indians were surprised, I can only answer with a theory of mine that Indians who hunt on horseback have small knowledge of mountain sheep. Antelope, deer, white-tail and black, and even elk, can be, and are constantly thus hunted by the Indians; but when it comes to climbing where the horses cannot go, I suspect that his rider seldom goes either. Looking back, I see now that this whole excursion was conducted ignorantly, and that our guides (both of them excellent hunters of other game) neglected the very first principle here, namely, to get to the top of the mountains and hunt down.

We returned our long way to camp, and the

elk that one of us shot at sundown made no atonement for our melancholy farce. My diary concludes, "So ended Thursday, August 30, a most instructive day, full of weather, wind, and experience."

By breakfast we were bearing up a little, making much of the fact that, after all, the sheep we had seen were only ewes and lambs. This would not have caused us to spare them, to be sure; we were out of fresh meat when we saw them; and though the head and horns of a ewe do not make a noble trophy for the sportsman, they represent hard work, and are decidedly better than nothing at all when you are a beginner, and hungry.

We took another course, making for mountains on the side of the valley opposite from yesterday's route. My Indian was not hopeful. "Too much shoot," he remarked. "Run away." But presently we passed very fresh tracks, and began one of those ascents where you are continually sure that the next top is the real top. We had come looking for the sheep at a season when he is living mostly upon the roof of his house. He, with the goat, inhabits, it may be fairly said, the tallest mansion of all our ruminants; indeed, you may put the whole case thus: —

Our Rocky Mountains are a four-story building. The bottom is the sage-brush and cottonwood, the second is pines and quaking-asp, the third is willow bushes, wet meadows, and moraines, and the fourth is bald rocks and snowfields. The house begins about five thousand feet high, and runs to fourteen thousand. We have nothing to do with the prairie-dog and others that live in the cellar; it is the antelope to which the first floor belongs, and also the white-tail deer, which, however, gets up a little into the second. The elk, the black-tail, and the mule-deer possess second and third stories in common, while the fourth is the exclusive territory of the sheep and the goat. But here is the difference; these latter (the sheep, certainly) descend to all the other stories if the season drives or the humor suits them; they go from roof to ground, while the other animals seldom, save when hunted, are to be met above or below their assigned levels. I have met a sheep on Wind River in July where the sage-brush was growing, and another on a wooded foot-hill just above Jackson's Lake.

This day we went to the fourth story by a staircase dear to the heart of a sheep. I mounted through an uncanny domain where all about me

stood little pillars of round stones baked together in mud, and planted on end, each supporting a single rock of another color set upon them transversely; shafts of necromancy they would have seemed in the age of witches, altars which might flame by night while some kind of small, naked beings with teeth held rites over the traveller's crushed body, for from one's feet here the little stones rolled down to right and left into depths invisible. You who have not seen cannot imagine how here and there in the Rocky Mountains these masonries of nature suggest the work not of men but demons. Silence drew around me as I passed upward through the weird dwarf Stonehenge; and on top we found ourselves looking down the other side at a gray stump which presently moved. The glasses showed us the stump's legs and fine curling horns; and our hearts, which had been for some time heavy at the poor luck, grew light. Only, how to get at him?

We had almost given up the game when we spied the ram; we had come so far for so long; and we now had been sitting upon — almost straddling — this ultimate ridge, with the Indian every little while lugubriously repeating, "No sheep." The ram had not a suspicion of us, and

SURPRISED (White Sheep — *Ovis dalli*)

presently lay down in the sun near the bottom of a rocky gulch. The whole of the gulch we could not see, not even when we had crawled down a side of the mountain, an endless surface of rolling stones with scanty patches of grass and an occasional steadfast rock. This descent seemed the most taxing effort yet. It was nearly always (and sometimes quite) impossible to stir a foot or a hand, or shift any fraction of my weight, without starting a rippling stream of stones that chuckled and bounced and gathered noise as they flowed downward, and finally sprang into a rocky chasm which gave out hollow roars. I often felt certain these sounds must reach the ram; but they were only next door to him, so to speak, and separated by the tilted wall of mountain which divided his gulch from the one down the side of which I was so very gradually making my way. I don't believe the whole distance could have been more than three hundred yards; yet I was nearly thirty minutes accomplishing it with the help of the grass tufts and every other fixture that came within available reach in this sliding sea of stones. I at length arrived where I wanted to be, and a truly unkind thing happened: I was taken with "buck-fever"! It didn't prevent my

finally getting a shot in; but here is the whole adventure.

I lifted myself and looked over the edge into the next gulch. There was the ram, who saw me at the same moment, and rose. I probably missed him; for after my shot he continued to walk toward me in a leisurely manner, not fifty yards distant, I should think, down in his gulch. Whether I fired at him again or not, I *can't remember*, — couldn't remember that same evening when I tried to put the whole event faithfully down in my diary! Buck-fever is not the only reason for this uncertainty; for now, from behind every rock below me, horns rose up like tricks out of a trap-door, apparitions of horns everywhere, an invasion of mountain sheep. They came straight up to me, — this was the most upsetting part of it all. Not one did I see running down the gulch; they hadn't made me out, or made anything out, save that some noise had disturbed them. They came up and up around me, passing me, steadily coming and going on over the mountain while my buck-fever raged. "I saw their big grave eyes and the different shades of their hair, and noticed their hoofs moving — but whether they came by fast or slow,

or what number there were, I cannot remember at all." Such are the actual words I wrote not more than six hours later, and I am glad to possess this searching record of that day and of my bygone state of mind; for with the best honesty in the world no man can from memory alone rebuild the minute edifice of truth that has been covered by the heap of fifteen gathering years. So I stood, crazy and inefficient, upon the mountains, and after a little no more sheep were there. A speck of conscious action remained with me, namely, that during the passage of the sheep I had held myself enough in control to get "a bead" on the broadside of two successively; I remembered following them along for a moment with my rifle before pulling the trigger. But these I never saw again, and know not where I hit them — if hit them I did. One trophy remains to show for this day. A ram that had been shot at some moment of the invasion returned to the gulch where I was, and stood at a short distance above me; and then I succeeded in placing one shot where I meant it to go.

The visions of this band, as it scattered in twos and threes after crossing my gulch, would incline me to guess there must have been from fifteen to

twenty of them — all rams. Their sex is quite certain; the most intense impression that was given to my unstrung perceptions is of their huge curving horns and their solemn eyes. It is hateful to think that some of them were hurt and so went off to limp, or to die; and I am thankful to have but very few memories of wanton shooting, and some consoling ones of temptations resisted. These rams mostly escaped the indiscriminate blasts from my rifle; of this I am sure. I saw them, high and low, near and far, scuttling into safety over the steep ridges, or down into unseen cañons; and upon presently searching the vicinity, we found but one trace of blood. As for the buck-fever, it was the first seizure that I ever had, and it has proved the last. Why it should have held off in previous years and come down upon me in 1888, who shall say? You will wonder as much as I do that a silver-tip bear did not give me the slightest touch of it in July, 1887. A bear is more important game than a sheep; this grizzly was the first I had ever seen, and I was less experienced. Excitability is a matter of temperament that varies infinitely; but this scarcely explains why, with a bear to shoot, no cucumber could have been

cooler than I was one year, and why the next, with these rams, I seem to have been a useless imbecile. The unexpected apparition of so many animals does not account for it, because when I raised myself to look over the ridge before my first shot that brought them into sight, I was shaking thoroughly.

These proceedings did not, at any rate, impair appetite. With the flavor of elk, deer, antelope, bear, and even porcupine, we were familiar; but wild mutton was still a great novelty, and we found it the most palatable of all. I say "we found it" and not "it was," because I have found a lump of dough sponged round a tin plate full of bacon grease so very delicious! The romance of wild game so mixes with its taste that we carve a venison steak with unction and respect. Yet I have come almost to think that our good old friend roast beef is more savory than anything we can find in the woods. If it is merely the pleasure of the table that you seek, take a good walk every day in the park, or even just up and down town, and the meats from your kitchen (if your lot is blest with a kitchen) will be superior to all the meats of camp.

I become, as I look back, surer than ever that

our Indians knew not much more than we did ourselves about the habits of the mountain sheep, and that they did as little reasoning as we did. On the day preceding this, what had been our experience? To run into bands of ewes and lambs. If the women and children were thus off by themselves in the month of August, it was no great jump to conclude that the men must be keeping each other company somewhere else. When we spied that ram down the gulch sunning himself, we should have tried to ascertain whether or not he was alone. As a matter of natural history, the summer season does find the *Ovis canadensis*, as well as many other of the ruminants, thus separated by sex; and the chances are that if you meet a ewe she is not far from more, and that a ram had better not be presumed solitary until his individual habit has been so proved. You are not likely to find ewes and rams together till the rutting season,[1] in December. I have read in some book, or books, that the lambs are dropped in March, but I think this is a somewhat early date, or, rather, that many

[1] The ram's horns cease growing at the time of the rutting season, and do not begin again until the spring brings nourishing food. This causes the rings on the horns, it is said, which indicate the number of winters old the sheep is.

come in April, and that it is scarcely correct to limit their season to the single month. The lambs, from the time of their birth on into the late fall, follow their careful mothers — receive, in fact, a half-year's bringing up. And I had, one day in September, 1896, the singular good fortune to watch a mamma with her child for a period even longer than my observation of the ram at Livingston.

The Tetons lie just south of the Yellowstone Park, and directly upon the borders of Wyoming and Idaho. Any recent map might seem to prove this geography inaccurate, because, as I understand it, a late extension of the timber reservation reaches below these mountains, and most wisely includes both them and Jackson's Lake with the whole piece of country eastward to the Continental Divide. Of all places in the Rocky Mountains that I know, it is the most beautiful; and, as it lies too high for man to build and prosper in, its trees and waters should be kept from man's irresponsible destruction; those forests feed the great river system of the Columbia and Snake. But I have been a poacher, according to the recent map. In 1896, however, the line was north of me by a few miles; and the day before

I saw the ewe and the lamb, I had shot a ewe. It is, I believe, considered unsportsmanlike to do this; I have never seen the sportsman yet, though, who would not cheerfully bring home a ewe to an empty larder. Our larder was empty, even of fish, which had been plentiful until we had climbed up here among the Tetons, where the brooks ran too small for fish.

My object this second day was to find, if I could, a ram; and it proved one of those occasions (sadly rare in my experience) when, being disappointed of one's wish, something actually better descends from the gods, bringing consolation. It was a climb less severe than those of which I have already written, for our camp among the Tetons was close to the fourth story; less, I should suppose, than a thousand feet above our tent, the mountain grew bare of trees. Upward from this, it was not a long walk to snow.

When first I saw the mother and child, I already had them at a great disadvantage; they were, to be sure, where I had not expected them to be, but I was where they had not expected me to be; and thus I became aware of them a long distance below me, actually coming up to me by the trail I had come myself. Trail, you must

understand, does not here mean a path beaten by men, or even by game, but simply the pleasantest way of getting up this part of the mountain. The mother had been taking her child upon a visit to the third story, had been away down among the pine woods and open places, where brooks ran and grass grew with several sorts of flowers and ripe berries; and now she was returning to the heights of her own especial world. Alas for my camera! it was irretrievably in camp. I laid my useless rifle down, for from me neither of these lives should receive any hurt; and with the next best thing to a camera — my field-glasses — I got ready for a survey of this family as prolonged and thorough as they should allow. But field-glasses are a poor second best in such a case; a few pictures of this lady and her offspring "at home" would have told you more than my words have any hope of conveying.

I never saw people in less haste. From beginning to end they treated the whole mountain as you would treat your library (dining room were, perhaps, nearer the mark) upon an idle morning between regular meals. No well-to-do matron, with her day's housekeeping finished, could have

looked out of the window more serenely than this ewe surveyed her neighborhood. The two had now arrived at what, in their opinion, was a suitable place for stopping. "Their" opinion is not correct; it was, I soon unmistakably made out, the mamma who — far more than the average American mother as American mothers go now — decided what was good and proper for her child. This lamb was being brought up as strictly as if it were English. They had just completed a somewhat long and unrelieved ascent, — so I had, at any rate, previously found it. This upper region of the mountain rose above the tree belt in three well-marked terraces which were rimmed by walls of rock extremely symmetrical. Each terrace made a platform fairly level and fairly wide, upon which one was glad to linger for a while before ascending the slant to the next terrace wall. I was seated at the edge of the top terrace, a floor of stones and grass and very thick little spruce and juniper bushes; the mamma had just attained the terrace next below me, and up the wall after her had climbed and scrambled the little lamb with (I was diverted to notice) almost as much difficulty as I had found at that spot myself. The mamma knew a good deal

THE SADDLEBACK SHEEP — (*Ovis fannini*)

more about climbing than the lamb and I did.

There this couple stood in full view some few hundred feet — about three hundred, I should think — below me; and here sat I at my ease, like a person looking over a comfortable balcony, observing them through my glass. There was a certain mirth in the thought how different would have been the mamma's deportment had she become aware that herself, her child, and her privacy were all in the presence of a party who was taking notes. But she, throughout, never became aware of this, and I sat the witness of a domestic hour full of discipline, encouragement, and instruction. The glasses brought them to a nearness not unlike peeping through the keyhole; I could see the color of their eyes. The lady's expression could easily have passed for critical. After throwing a glance round the terrace, her action to the lamb was fairly similar to remarking, "Yes, there are no improper persons here; you may play about if you wish."

Some such thing happened between them, for, after waiting for the scrambling lamb to come up with her on the level and stand beside her,

she appeared to dismiss it from her thoughts. She moved over the terrace, grazing a little, walking a little, stopping, enjoying the fine day, while her good child amused itself by itself. I feared but one thing,—that the wind might take to blowing capriciously, and give their noses warning that a heathen stranger was in the neighborhood. But the happy wind flowed gentle and changeless along the heights of the mountains. I have not more enjoyed anything in the open air than that sitting on the terrace watching those creatures whose innocent blood my hands were not going to shed.

After a proper period of relaxation, the mother judged it time to go on. There was nothing haphazard in her action; of that I am convinced. How she did it, how she intimated to the lamb that they couldn't stop here any longer, I don't pretend to know. I do, however, know that it was no mere wandering upward herself, confident the lamb would follow; because presently (as I shall describe) she quite definitely made the lamb stay behind. She now began mounting the hill right toward me, not fast but steadily, waiting now and then, precisely as other parents wait, for her toddling child to come up

with her. Here and there were bushes of some close stiff leaf, that she walked through easily, but which were too many for the toddling child. The lamb would sometimes get into the middle of one of these and find itself unable to push through; after one or two little efforts, it would back out and go round some other way, and then I would see it making haste to where its mother stood waiting. Upon one of these occasions the mother received it with a manner that seemed almost to say: "Good gracious, at your age I found no trouble with a thing of that kind!" They drew, by degrees, so near me that I put away my glasses. There was a time when they were not fifty feet below me and I could hear their little steps; and once the ewe sneezed in the most natural manner. While I was wondering what on earth they would do when they found themselves stepping upon the terrace into my lap, the ewe saw a way she liked better. Had she gone to my left as I watched her, and so reached my level, the wind would have infallibly betrayed me; but she turned the other way and went along beneath the terrace wall to a patch of the bushes high enough to make severe work for the lamb. While she was

doing this, I hastened to a new position. Where I had been sitting she was bound to see me as soon as she climbed twenty feet higher, and I accordingly sought a propitious cover, and found it in a clump of evergreens. She got to the wall where she could make one leap of it. It was done in a flash, and resembled nothing that any well-to-do matron could perform; but once at the top, she was again the complete matron. She scanned the new ground critically and with apparent satisfaction at first. I stole the glasses to my eyes and saw her closed lips wearing quite the bland expression of a lady's that I know when she has entered a room to make a call, and finds the wall-paper and furniture reflect, on the whole, favorably upon the lady of the house. Meanwhile, the poor little lamb was vainly springing at the wall; the jump was too high for it. Its front hoofs just grazed the edge, and back it would tumble to try again. Finally it bleated; but the mother deemed this not a moment for indulgence. She gave not the slightest attention to the cry for assistance. There was nothing dangerous about the place, no unreasonable hardship in getting the best of the wall; and by her own processes, whether you

term them thought or instinct, she left her child to meet one of the natural difficulties of life, and so gain self-reliance.

Do you think this fanciful? That is because you have not sufficiently thought about such things. The mamma did undoubtedly not use the words "self-reliance" or "natural difficulties of life"; but if she had not her sheep equivalent for what these words import, her species would a long while ago have perished off the earth. The mountain sheep is a master at the art of self-preservation; its eye is tenfold keener than man's, because it has to be, and so is its foot ten or twenty fold more agile; every sense is developed to an extreme alertness. It measures foothold more justly than we do, because it has had to flee from dangers that do not beset us. That the maternal instinct (which these mothers retain until their young can shift for themselves) should fail in a matter so immediate as the needs of its young to understand rock climbing, is a notion more unreasonable than that it should be constantly attentive to this point. But — better than any talk of mine — the next step taken by the ewe will show how much she was climbing this mountain with an eye to her offspring.

The lamb had bleated and brought no sign from her. She continued standing, or moving a few feet onward in my direction. This means that she was coming up a quite gentle slant, and that thirty yards more would land her at my evergreen bush. She came nearer than thirty yards and abruptly stopped. She had suddenly not liked the looks of my evergreen. Behind her on one side, the last steep ascent of the mountain rose barer and barer of all growth to its stony, invisible summit which a curve of the final ridge hid from view. Behind her, down the quiet slant of the terrace, was the wall where she had left the lamb. She now backed a few stiff steps, keeping her eye upon the evergreen. Her uncertainty about it, and the ladylike reserve of her shut lips, caused me to choke with laughter. To catch a wild animal going through a (what we call) entirely human proceeding has always been to me a delightful experience; and from now to the end this sheep's course was as human as possible. I had been so engaged with watching her during the last few minutes that I had forgotten the lamb. The lamb had somehow got up the wall and was approaching. Its mamma now turned and moderately hastened

down the slope to it. What was said between them I don't know; but the child came no farther in my suspicious direction; it stayed behind among some little bushes, and the mother returned to scrutinize my hiding-place. She looked straight at me, straight into my eyes it seemed, and her curiosity and indecision again choked me with laughter. She came even nearer than she had come before. How much of me she saw I cannot tell, but probably my hair and forehead; she at any rate concluded that this was no suitable place. She turned as I have seen ladies turn from a smoking-car, and with no haste sought her child again. How she managed their next move passes my comprehension; I imagined that every foot of the mountain ascent near me was in my full view. But it was not. Quite unexpectedly I now became aware of the two, trotting over the shoulder of the ridge above me, with already two or three times the distance between us that had been just now. If I had wished to follow them, it would have been useless, and I had seen enough. When I was ready, I made for the summit myself. The side which I had so far come up was the south side, and a little further climbing took

me over the narrow shoulder to the north, where I was soon walking in long patches of snow. Across these in front of me went the tracks of the mamma and her lamb, the sage and gentle guide with the little novice who was learning the mountains and their dangers; across these patches I followed them for several miles, because my way happened to be theirs. No doubt they saw me sometimes; but I never saw them again. I hope no harm ever came to them; for I like to think of these two, these members of an innocent and charming race that we are making away with, as remaining unvexed by our noise and destruction, remaining serene in the freedom that lives among their pinnacles of solitude.

AMERICAN BIGHORN

(OVIS CANADENSIS[1])

The bighorn of the American continent, inclusive of its local races (frequently regarded as distinct species), is a large sheep, distinguished from the Asiatic argalis, among other features, by the comparative smoothness of the horns, in which the outer front angle is prominent, and the inner one rounded off, and also by the smaller size of the face glands. There is a well-marked whitish patch on the rump, but the amount of white on the under parts and legs shows considerable local variation. In the typical Rocky Mountain race (*O. canadensis typica*) the ears are long and pointed, with short hair, and the horns, which are very heavy, diverge but little outwards, and generally have the tips broken. The Californian *O. canadensis nelsoni* is a paler southern race. On the other hand, in *O. canadensis stonei* of the northwest territories the color of the back is very dark, and the white on the belly and legs sharply defined. And both in this race and the light-colored *O. canadensis dalli* of Alaska the horns

[1] "Records of Big Game," Rowland Ward, third edition.

are lighter, more divergent, and sharper pointed, while the ears tend to become shorter, blunter, and more hairy. Height at shoulder about 3 feet 2 inches; weight about 350 pounds.

The horns of the ewes are very small in comparison to those of the rams, seldom measuring more than 15 inches on the curve from base to tip. Large male horns are now difficult to obtain, and of late years it is seldom that those of fresh-killed specimens are seen exceeding 38 inches on the curve from tip to tip. American sportsmen are keen to obtain horns of large basal girth; but these, as will be seen from the following table, rarely exceed 16 inches. The Maclaine of Lochbuie possesses a specimen whose girth, according to his own measurement, is 19 inches.

Distribution.—North America, from the Rocky Mountains southward to Sonora, northern Mexico, and California, and northward to Alaska and the shores of Bering Sea. The Alaskan race, for at least some portion of the year, is snow-white.

MEASUREMENTS OF HORNS

LENGTH ON FRONT CURVE	CIRCUM-FERENCE	TIP TO TIP	LOCALITY	OWNER
−52½	18½	..	The Selkirks, B.C., 1885	W. F. Sheard
−45	..	..	?	W. Grant Mackay
−42½	16¼	25¾	Lower California	George H. Gould
42	16	(tips much worn)	Wyoming	Picked up by T. W. H. Clarke
..	17¼	..	Wyoming	T. W. H. Clarke
−41½	15	..	Kootenay, B.C.	Measured by John Fannin, Provincial Museum, B.C.
−40⅝	16½	..	Yellowstone	British Museum
40¼	15¼	20¼	?	Sir Edmund G. Loder, Bart.
−40	15½	..	Rocky Mountains	Otho Shaw
40	15	21½	British Columbia	J. W. R. Young
39⅝	15⅜	..	Colorado	St. George Littledale
39½	16½	24¾	Montana	British Museum
39½	15½	19	?	Sir Edmund G. Loder, Bart.
−39	15¾	..	?	W. A. Baillie-Grohman
38⅜	15½	22	?	Gerald Buxton
38¼	16⅜	..	Bighorn Mountains	H. Seton-Karr
38¼	15¼	19¼	Montana	Edmund Littledale
38¼	16	19	N.W. Territories	S. Ratcliff
38	17	..	Alberta, N.W.T.	Arnold Pike
38	15	..	British Columbia	Captain F. Cookson
−38	16½	..	British Columbia	Major C. C. Ellis
37¾	15⅞	23⅜	Mexico	J. A. H. Drought
−37⅜	16¼	22½	British Columbia	J. O. Shields
37¼	15½	16	British Columbia	J. Turner-Turner
−37	16	31	Wyoming	T. W. H. Clarke
37	16¼	..	Montana	Major Maitland Kirwan
37	16⅝	16	British Columbia	R. H. Venables Kyrke
37	15½	18½	Wyoming	Lord Rodney
36¾	19	15	British Columbia	C. H. Kennard
36¾	15¼	22½	Wyoming	Moreton Frewen
36½	14½	..	Wyoming	Gerald Buxton
36½	16	..	?	Thomas Bate
36½	14	..	?	J. D. Cobbold
36¼	14⅜	18½	?	Gerald Buxton
36	14⅝	16½	Montana	R. H. Sawyer
36	15½	..	Alberta, N.W.T.	Arnold Pike
36	14⅝	16	Wyoming	Capt. G. Dalrymple White
−35⅞	14¾	17½	Wyoming	Count E. Hoyos
35¾	15¼	18½	British Columbia	G. Wrey
35⅝	13¾	17½	British Columbia	Hon. S. Tollemache

MEASUREMENTS OF HORNS (*continued*)

LENGTH ON FRONT CURVE	CIRCUMFERENCE	TIP TO TIP	LOCALITY	OWNER
35½	16	21	British Columbia	T. P. Kempson
35¼	12¼	16	California	Sir Victor Brooke's Coll.
35¼	15¼	18½	British Columbia	Sir Peter Walker, Bart.
35	14	18½	British Columbia	Admiral Sir Michael Culme-Seymour, Bart.
−35	15	19¾	Wyoming	Count Schiebler
35	14	16	Wyoming	Gerald Hardy
34½	14⅜	19	S.E. Montana	J. A. Jameson
34½	14½	..	California	G. P. Fitzgerald
−34	16	17	N.W. Wyoming	A. Rogers
34	16¼	20	British Columbia Border	Barclay Bonthron
33½	15¼	..	British Columbia	Admiral Sir Michael Culme-Seymour, Bart.
33	15⅜	18	British Columbia	Capt. E. G. Verschoyle
33	14⅜	24½	Wyoming	Lieut.-Col. Hon. W. Coke
33	14½	22	?	F. H. B. Ellis
33	14	23	British Columbia	T. P. Kempson
33	15½	22	British Columbia	A. E. Butter
32¾	15½	17½	?	C. G. R. Lee
−32½	14⅝	19½	Fraser River, B.C.	A. E. Leatham
32½	15	17½	Lower California	G. Barnardiston
32	15½	19½	British Columbia	J. W. Wood, Jr.
32	14⅝	17¼	Yellowstone River	British Museum
31½	14½	17½	N.W. Territory	Maj. Algernon Heber-Percy
31	17½	..	Grand Encampment, Wyo.	Frank Cooper
−31	13	22	British Columbia	T. E. Buckley
30¾	15	23 about	?	Hon. Walter Rothschild
30½	15¾	17½	Lower California	Ely Quilter
30½	15½	18	Wyoming	J. L. Scarlett
−30½	14	15½	Wyoming	Hugh Peel
30	15¼	14	Alberta, N.W.T.	F. C. Williamson

ALASKAN BIGHORN (*Ovis canadensis dalli*)

34	12⅝	18⅛	Alaska	Rowland Ward
33	12¾	15	Alaska	Hon. Walter Rothschild
32½	13¼	20½	Alaska	J. T. Studley British Museum
♀9⅛	4⅞	8	Alaska	British Museum

THE WHITE GOAT AND HIS WAYS

By Owen Wister

ABOVE TIMBER LINE

THE WHITE GOAT AND HIS WAYS

SHOULD you wish with your own eyes to look upon this odd and much-debated creature, it is (to name some of his territories) in the Saw Tooth Range in Idaho, and among the peaks northward from Lake Chelan, the Okanogan and Methow rivers, all three in Washington, and also upon many mountains near the coast in British Columbia that, if you climb high and hard enough, you are almost sure to find him; and you would be perfectly certain to find him in the Zoölogical Gardens at Philadelphia to-day April twenty, 1903. But it may be that by the time you shall read this the summer heat of Philadelphia will have ended his existence there; and this is the only place in our country (or in any country at present writing) where he is in captivity. Of his natural habitat and the interesting questions that it raises, I shall presently speak; let me at once dismiss the question

of his species, now finally known as *Oreamnus montanus.*

He is not a goat at all. We have fallen to speaking of him so in English because for a good number of years it has been the name he has gone by where he lives; but he is an antelope, and his nearest relative is the chamois, whose quite peculiar way of walking his own gait closely resembles. The chamois I have never hunted, but have often watched the singular hunching and truculent movement of the goat, as with head lowered (you might suppose for a charge) he slowly and heavily proceeds along his chosen vertiginous paths of rock and snow. He is a mountain antelope; and his various Latin names, and the confusion, both popular and scientific, of which he was the subject through most of the nineteenth century, are curious and interesting matters. He was doubtless in zoölogic truth an emigrant, having walked from frozen Asia to frozen America across that great old Aleutian Isthmus between two frozen oceans, adjacent seas unmerged as yet by Behring Strait. With other newcomers he replaced the original dwellers of the soil, the American rhinoceros and any number more of old inhabitants with whom the climate had ceased to

agree. After landing upon our continent away up in the north the goat and sheep spread themselves widely; but the goat not half nor a quarter so widely as the sheep. The more we compare these similar creatures, the more singular seem their contrasts.

If they were fellow-travellers and twin arrivals, if they did come over the Aleutian bridge together, it is either because there was only one bridge and both had to use it, or else they fell out on the way, and reached here not on speaking terms. The first hypothesis is the one to which I incline: they had to use the same trail because there was only one. Sheep and goat do not seem to me to live on good terms. I should not venture this observation were it based upon my individual experience alone. What my campings have gradually led me to notice is this: you don't find sheep and goat on the same hill as you find elk and deer in the same wood. Considering that both animals like steep places, like rocks, like very high rocks; and also that their respective habitats coincide in certain regions, — in British Columbia, for instance, and in Washington, and, I think one might fairly add, in Idaho, — I dare by no means make the sweeping assertion that

sheep and goat have never been found, or are never to be found, frequenting the same pasture; I don't know this, and all of us do know that negatives are difficult of proof. But I have camped high in Washington, with goats in profusion all around, and the whole country looking precisely like a sheep country, yet never the sign of a sheep anywhere to be seen. People said, "Plenty of sheep over there," and they would point to some clearly visible heights. And next, people came from not thirty miles away, having seen and killed sheep. It was the same latitude, the same altitude, the same season, the same everything. What is to be drawn from this? That it was an accidental year, and just happened so for the few weeks that I was there? This is the conclusion that you might draw, as I then did; and you would be wrong, as I then was. For I returned there six years later, and it was still the case, and had been the case meanwhile, saving only that goats and sheep and all wild animals, wherever their chosen abode was, had been growing scarcer and shyer, and were approaching that extinction which we deal to all helpless things that do not minister to our own comfort and survival. During those intervening years I had hunted sheep in a country which for

all the world looked as if a goat might come round the corner at any moment. But no goat ever did; and yet, had I ridden down those mountains, and over a space of plains to the westward, and up the very first mountains I should then have met, there would then have been all the goat I wanted, and not (I have been told) a single sheep!

Thinking these things over, I began to wonder if some particular kind of food (since climate it could absolutely not be) was the cause of this flocking apart. Was there, perchance, some little herb which a goat must have and a sheep didn't like? Well, if that be so, no botanist has so far told me its name; while on the other hand, very recently, I have had news of a sportsman who was hunting in some mountains of British Columbia where sheep and goat were both readily to be found, and whose experience was like mine, only more marked and significant. He had stood upon one mountain where there were goat, and looked across to an adjacent one where he could plainly see sheep. Now on his mountain there was not a single sheep; he must go to the other for them; but over there he must expect no goat. He found this so, and he was assured that it was

always so: the animals did not seem to trespass upon each other's premises.

These few facts that I have here gathered seem to me worthy of recording, and perhaps enough to warrant a presumption; but insufficient for an assertion. Until others shall have on their part added similar observations, I would lay down no rule that a chronic hostility separates *Ovis* and *Oreamnus*. Perhaps such a rule has been laid down, but if it be printed anywhere, I have not met it; nor have I had the fortune (after consulting the books) to meet any accounts of goat which essentially add to what has been said already by Audubon; and that is somewhat meagre. Many pictures there are, much better than his old-fashioned plates, but further solid information is uncommonly scarce. Even the latest and most official authorities, when you test their pages by an intimate searching for a piece of comprehensive and definite information, do not give you that information.

If my surmise be true, and sheep and goat are apt to be upon strained relations, I think we may be certain which of the two has regulated the affair. I will hazard the guess that in single combat the goat could ruin the sheep before the

sheep was fully aware of what had befallen him. Hunters can picture such an encounter, which probably would be brief if grand. The gallant old sheep would stand, aim, bound to the attack and leap in the air, expecting to dash his forehead and curling horns against the face and horns of the goat. But the goat — ah! that's not the goat's way. It would have happened so quickly as not to be made out; but there the poor ram would lie, ripped open. The goat does nothing so picturesque and unpractical as jumping in the air. He lowers his sullen head, one shrewd thrust and jerk-back with his deadly sharp horns, and the business is despatched. And the goat looks it, too. His appearance suggests immediately that you had better look out for him if you happen to be a ram with beautiful useless horns — useless, that is, against any such apparatus as the goat carries. One day I stood watching a good specimen billy-*Oreamnus*. The nanny, less conspicuous, lay in the shade on some flat ground, asleep. But the billy sat hunched on the peak of a built-up pyramid of rocks. It was in the Zoölogical Gardens at Philadelphia where this pair, taken into captivity in 1901, have grown and thrived, but have not bred. The billy shows his for-

midable nature; no strangers can go near him; he would disembowel them in a jiffy; even his keeper has to be wary. At the top of his pile of rocks sat the captive, hunched, as I have said, and truculent and lowering, in spite of his stillness. His eye had that gaze which so wonderfully remains with wild animals who are prisoned from the great free natural spaces that belong to them, whose birthright is a liberty of no sparrow-and-robin size, but a colossal liberty, the range of the primal world, where fences and statutes are not. Our delightfully conventional intelligence is familiar with this look in the eyes of the lion and the eagle because the poets have called our attention to it, have said pretty things about it; but if you have the unusual gift of making your own observations, you will find it in many other animals, including certain types of man. As for this goat, no goat sitting on a rock at Harlem could stare like him; he might have been sitting on the top of the Cascade Mountains, surveying huge gulfs, and (possibly) meditating how improving it would be to disembowel a ram.

As I watched him, an odd thought revisited me: how Asiatic he looked, for some obscure reason! I remembered thinking this same thing

when I had shot my first goat eleven years before. Asiatic? Yes; and I cannot at all explain why, unless it be that one has seen pictures of animals which hail from somewhere like Tibet, and which bear some resemblance to the *Oreamnus*. I know that no other of our Western big game strike me in this way; buffalo, elk, deer, antelope, sheep, — all these have always seemed to me to look indigenous, to belong to our North American soil. But this goat is a figure that it surprises me to meet among the haunts of my own language; his idiom should be Mongolian!

He's white, all white, and shaggy, and twice as large as any goat you ever saw. His white hair hangs long all over him, like a Spitz dog's or an Angora cat's; but it is stiff and coarse, not silky, and against its shaggy white mass the blackness of his hoofs, and horns, and nose, looks particularly black. His legs are thick, his neck is thick, everything about him is thick, saving only his thin black horns. They're generally about six inches long, they spread very slightly, and they curve slightly backward. At their base they are a little rough, but as they rise they cylindrically smooth and taper to an ugly point. His hoofs are heavy, broad, and blunt. The track they make is huge,

and precisely the reverse of the sheep's; it is a capital V, pointing backward. The sheep's track is a V also, but pointing forward. By his clumsy-looking hoofs, and his thick-set and apparently unwieldy legs, it would seem as though this goat had best keep his level, as though he might seldom go up two steps of even a porch without accident; a set of legs and hoofs could scarce be instanced of seemingly less avail for a mountaineer. So, at least, I should argue, recalling the various sharp apparatus which we need ourselves. One does not see how these heavy animals can leap and cling. But let me transcribe uncorrected some sentences from my hunting journal of November, 1892, pencilled in flippant spirit after a day's pursuit of the goat.

"They . . . chose places to lie down where falling off was the easiest thing you could do. . . . The individual tracks we have passed always choose the inclined plane where they have a choice between that and the level. . . . I suppose these animals sometimes must fall, though they have a projecting heel of horn to their hoof which is wonderfully adapted to their vertical habits. But if they do fall, it probably amuses them. Their hair is more impenetrably thick

than any hair I have seen, and beneath this is the hide thicker than buffalo. If they play games together, it is probably to push each other over a precipice, and the goat that takes longest to walk up again loses the game."

You can see from these lines what a tide of resentment flows between them. I remember that hard but successful day very well; and it furnished some facts about size and weight and so on, which were all recorded on the spot, and which give some good details well to know.

To begin with, there is that "projecting heel of horn" to the goat's hoof. We cannot imagine how he manages to make such a slight thing (not over a quarter of an inch) catch his weight. He weighs anywhere from one hundred and eighty to three hundred pounds. I had no means that day on top of the Cascade Mountains to ascertain how much the male I had killed might weigh, but he was very much of a load for two of us to move. His hide (not the hair but the leather) on his rump was as thick as the sole of my boot. My boot was made for climbing mountains, and the sole was filled with hobnails; the hide was as thick as such a sole, and when balanced against things in camp whose weight we

knew, — such as flour and sugar bags, — it alone weighed thirty pounds! We carried home, beside the head and hide, the web-tallow, and this was three-quarters of an inch thick. Hunters will know what ample supply this means in animals much larger than the goat. This specimen was, my most companionable guide told me, of good but not supreme size. We carried home none of the meat. The flesh of the grown-up goat cannot be eaten with much pleasure; but later, for the sake of a complete set of specimens, I shot a kid; and the flesh of this we ate with entire satisfaction for our Thanksgiving dinner. And this brings me to the next point.

"These wild goat," says my journal, "are twice the size and more of the ordinary goat, and if their hides kept clean and snow-white as they naturally are, they would be a splendid-looking animal."

This was written two weeks before I was able to examine one that was in very truth snow-white; and lately, while looking through the books to find what they have to say that may fill out my imperfect knowledge, I have come more than once on the statement that the goat is not pure white, but has a tinge of yellow, or

some shade, here and there, that dulls his total sheen. This I conceive to be error. Age, it is possible, may bring a few dark hairs to the white goat. But I should wish to be very sure about this before I asserted it. The sum of my experience is, that first I killed some plainly old male goats (they were off by themselves, no longer with the herd), and of these the coats were dingy; that presently I found a plainly younger male goat (he was lighter in weight and his horns and hoofs showed less wear), and his coat was spotless; and that finally I found the coat of a kid born that same year to be equally spotless. What is the inference — almost the conclusion? Is it not that in the older goats the color was discoloration, from causes external; that by nature the goat is perfectly white; and that the books have gone on reproducing an original mistake which grew from some writer's having seen only goats that were weather-stained? Oh, the reproduction of error! The way one man's inaccurate statement is blandly copied down by the next man, and verification shirked at every turn! Why will they do it, these little scientific folk? For the great ones never do. The great ones verify, or else, when they come to a hole in their

knowledge, they frankly tell you that they don't know. They paste no piece of paper over the hole, pretending it's all solid underneath. But the small fry — the popular magazine size, — these unceasingly are pasting paper. And why? Because they're not afraid of being found out. They know how few of their readers can discover the holes and poke their fingers through the paper. Don't you believe me, reader? Does your kind heart repudiate with heat this aspersion? Perhaps — for instance — you're not aware how some little writers go on deriving the name of a well-known St. Lawrence fish from two French words, *masque allongée.* I would tell you about it, only I did not discover their ludicrous blunder myself; but here's a hole where I happened to poke my own finger through the paper. During ten years I used every official map of Wyoming that I could procure. First it was a territory, and next a state, but all the while the map-makers continued to draw Pacific Creek as flowing into Buffalo Fork. Now Pacific Creek is a thoroughfare between the two sides of the Continental Divide, and it does not flow into Buffalo Fork, but into Snake River. It was a really bad geo-

graphical mistake. Some original map-maker had traced his map on hearsay or guesswork, hadn't gone down the creek to see for himself, and all his successors faithfully reproduced his ignorance. The people who knew better were merely Indians, prospectors, cowboys, or stray hunters like myself. We didn't count; *that* wasn't being found out!

Pacific Creek being wrong to a certainty, how then about Atlantic Creek, and Thoroughfare, and a good many more? Did these, also, flow one way officially, and actually another? How could I be sure until I had crossed mountains and found them for myself? And how should you, reader, enjoy being condemned to such maps in a country where Indians, and bears, and blizzards prevailed? You will scarce wonder that I grew to place upon those maps the same chastened reliance that I place to-day upon books which tell me that the goat is not strictly white, or that he lives in the Rocky Mountains. You might search a good many hundred miles of Rocky Mountains that have never seen a goat, but which the sheep has frequented since before the memory of man. Here again comes the contrast between the two: having come the same

road from Kamchatka, their ranges upon this continent but partially coincide, and even where both animals are established and flourishing in the same zone, their localities within that zone are so capriciously separated as to baffle even the explanation that one drives the other out.

It would seem that they can stand equal cold; both are to be found in Alaska, as might be expected from the manner of their emigration. And beginning with Alaska (one authority, R. Lydekker, "The Royal Natural History," London, 1898, the best authority I have found for coherence and completeness, names latitude 64° as the northern limit), we find goat and sheep alike plentifully distributed as we come south. But only for a certain distance. If the Northwest be plain like a picture in your mind's eye, you can recall how in the far North the Cascades and Rockies are intermingled, and how, as we come down through British Columbia to our own soil, they gradually separate, slope apart, so that by the time they reach the latitude of Portland, Oregon, a wide, flat domain lies between them. Both have slanted inland; but while the Cascades are only some hundred and sixty miles from the Pacific coast, the Rockies are away over in Idaho

and Montana, and continue to diverge until they sink among the hot sands of the mesquite and the yucca. Now, in Arizona, in the Colorado Cañon for instance, we still find the sheep, and can find him yet farther down in northwest Mexico. But no goat is so far south. The goat stops more than a thousand miles to the north. It seems clear, then, that goat and sheep will inhabit equal cold, but not equal heat.

Where, exactly, does the goat stop? That is something which no book (that I have seen) will tell you. The London book, which I have quoted already, names latitude 40° as the southern limit of his habitat. This is considerably farther south than I have ever heard of him. My knowledge of him goes no farther south than the Saw Tooth Range, which is in Idaho. These sharp ridges nourish the head waters of the Salmon River, and are in the southern-central part of the state. And I am inclined to say, in spite of Mr. Lydekker, but supported by Mr. Arthur Brown, that the Saw Tooth and Salmon River country in Idaho is about the southeastern corner of the goat's province. Saving stray and accidental individuals, you are not likely to find him beyond that point, south or east. I have never

talked with any hunter who had seen him in Wyoming, although (and here again I will reenforce my own experience with Mr. Brown's) there seems to be a sort of goat tradition in Wyoming, here and there. This myth is, to be sure, highly sublimated. You don't hear that goat used to be upon this or that definite mountain, or that So-and-So saw a man who saw a goat, or whose wife or uncle saw one; it never comes as near you as that; yet still faintly in the air of the Continental Divide there hovers this vague rumor of the animal.

If he was ever in Wyoming as a domiciled resident, who shall say why he departed? Why is he not to-day upon the Washakie Needle, or in the abrupt country where heads Green River, or among the formidable Tetons, since to-day he is but a little farther west of the Tetons, in the Saw Tooth Range? And why, if man (or sheep) drove him from these Wyoming peaks, has he not been driven from the peaks of Idaho? Difference in neither heat, nor cold, nor humidity, nor accessibility, can be the explanation, for there is no difference; and as for difference in food, I find no suggestion of it in the pages of the authorities.

"What they eat in winter is a mystery. But it must be the little knobs of moss that grow at the edges of the steep rocks on top, where the snow cannot lie. They never come down into the valleys, as the mountain sheep do when the snow grows deep up above."

This is no authority, but merely my camp notebook again; and the statement that the goat is never, like the sheep, driven to low pastures by the snow is but the popular account of him that I was able to gather from the inhabitants — the prospectors, the trappers — of the mountains where I hunted him. Yet it is interesting; and if generally true, it may furnish some clue to the capricious local separations between sheep and goat in the zone of their common habitat. But if the goat cannot, when the weather would drive him down, subsist upon the less lofty growths that then satisfy the sheep, you will remark how truly unlike the real goat is this narrow discrimination as to diet.

It is surprising, indeed, that at this late day, when investigation and verification are so easy, no naturalist seems anywhere to have written a plain, complete paragraph answering the plain, natural question: In what states and territories

does the white goat live? It would seem the naturalist's business to tell us this. We have the right to expect to open some single standard book, and find such facts at once. Well, I have had to open eight, gathering here a fact and there a fact in a manner not unlike the painful process of rag-picking. The result is far from covering the ground; let me acknowledge this, and beg friendly correction and amplification, — and let me say, nevertheless, that the following is the most detailed information to be found so far set down in any one place.

In Alaska and British Columbia we find the goat, and in northwest Montana, and in Idaho, but only in spots; he is also in the northern Cascades in Washington, but, oddly enough it appears, not in the Olympic Range. Nor is he in the southern Cascades, in Oregon. Elsewhere he is not, unless possibly in California. There is an ancient legend of him among the higher mountains of that state; the Spanish Padre de Salvatierra and his fellow-missionary, Padre Piccolo, are supposed to have seen him. We must uselessly wonder if they did; and I should have been more indebted to a foot-note in the "Biological Survey of Mount Shasta," which touches

upon the goat's habitat in Oregon and Washington, were it not wholly silent as to the animal's presence or absence, past or present, in the state of California.

The farther we follow the story of the white goat, the more do we find his steps attended with the mists of confusion; and for the gloomy critic this would be a timely moment to write some sentences about the longevity of error. But it all came out right in the end; and we will get to the facts at once, and how I first began to meet the stream of uncertainty of which the fountain-source lies in the old romantic pages of Lewis and Clark.

A while ago I spoke of a goat tradition in Wyoming. Now it was not until the fall of 1889 that I believed there was such a thing as this goat anywhere. I thought — I could not then say why — that the unlettered mountaineers and plainsmen, whose talk I heard, were speaking of the sheep; and, also, they contradicted each other in a way so curious and persistent that the animal became in a manner fabulous to me, like the unicorn, or the wool-bearing horse. Now I would meet the assurance that "over there somewhere," among the mountains near the Pacific, a snow-

white goat lived, with long hair; again, I would meet a positive denial of this. Some sceptical old trapper or prospector would proclaim that he "guessed he had been most everywhere," and nobody could "fool him about no goat" with long hair. Indeed, when I at last laid my own goat trophies, heads and hides, before the eyes of my old friend John Yancey of the Yellowstone Park, they gave him a genuine sensation. He had wasted small faith in any tales of goat. He stared at them, he touched them, he lifted them, he could not get over it; they caused me to rise in his esteem, and he refused to believe that circumventing a mountain sheep is a far more skilful exploit. He, too, like myself, had supposed that in some way this notion about goats could be traced to mountain sheep, and that they were one and the same animal. I found this error spread eastward to great cities.

In the front hall of a certain club there used to hang — and still hangs, for all I know — the head of a white goat. I stood near it one day in 1894 or 1895, while two gentlemen were looking at it. One had hunted in our West, and was asked by the other what animal this was. He replied with certainty, "A mountain sheep." It was no busi-

THE WHITE GOAT IS AN AGILE CLIMBER

ness of mine, and I did not correct him. But how inveterate and singular was the confusion! for these two wild animals do not resemble each other a particle more than do their domestic namesakes. In the hall of the club that day I did not know that, ninety years before, the self-same blunder had been made and written down for the first time, and that we were still inheriting its consequences.

On September twenty-six, 1805, Meriwether Lewis, quite inconveniently sick, was, with his equally inconveniently sick comrades, camped for the purpose of building canoes. They lay at the confluence of the north fork with the main stream of that river which Idaho now most often calls the Clearwater, and which the Indians then called the Kooskooskee. They had come overland a great way — two thousand miles — walking and riding. They had lately been high among the cold snows, and they were now abruptly plunged in the flat climate of the plains. Heat and the copious new food made every mother's son of them ill. But a few days before this, and they had been sparingly serving out rations of horse flesh to keep together soul and body; now the Indians have given them all the salmon they can

swallow, and taught them to eat the camass, a precarious vegetable. In the language of Doctor Coues (the admirable annotator of the 1894 edition, one can hardly imagine a better and honester piece of work): "Having been neither frozen nor starved quite to death — having survived camass roots, tartar emetic, and Rush's pills (the famous Dr. Rush of Philadelphia,) the explorers have reached navigable Columbian waters. . . ." I could quote from this splendid book forever. It is our American Robinson Crusoe. Somebody, no doubt, will grind it into a historical novel; but no novel, no matter how big a sale it has, can spoil the journal of Lewis and Clark. Well, at this sick camp, while they're making ready to float to Astoria, enter the white goat. It is his first recorded appearance.

Says Gass: "There appears to be a kind of sheep in this country, besides the ibex or mountain sheep, and which have wool on. I saw some of the skins, which the natives had, with wool four inches long, and as fine, white, and soft as any I had ever seen."

Here, you perceive, is the error, appearing simultaneously with the goat.

These sheep "live," says the text in another

place, "in greater numbers on that chain of mountains which forms the commencement of the woody country on the coast and passes the Columbia between the falls and rapids." Accurate in everything save the name.

Next comes the observation (William Dunbar and Dr. Hunter) written on the Columbia River near the Dalles: "We here saw the skin of a mountain sheep, which they say lives among the rocks in the mountains; the skin was covered with white hair; the wool was long, thick, and coarse, with long, coarse hair on the top of the neck and on the back, resembling somewhat the bristles of a goat."

This time, you see, they are on the very edge of getting the thing straight. But no; they recede again, after the following which seems to promise complete clearing up: —

"A Canadian, who had been much with the Indians to the westward, speaks of a wool-bearing animal larger than a sheep, the wool much mixed with hair, which he had seen in large flocks."

April ten, 1806, the party is on its return journey. It has successfully wintered on the coast, and has now come up the Columbia again, fifty miles above Vancouver.

"While we were at breakfast one of the Indians offered us two sheepskins for sale; . . . the second was smaller . . . . with the horns remaining. . . . The horns of the animal were black, smooth, and erect; they rise from the middle of the forehead, a little above the eyes, in a cylindrical form, to the height of four inches, where they are pointed."

Here there is no mistake about the mistake; he describes a goat and calls it a sheep. Why he should do this when he had seen the bighorn constantly during his journey up the Missouri may possibly be thus explained: He says that he did not think the bighorn much like a sheep, and so, perhaps, the goat did not strike him as much like a goat; we know it happens to be an antelope. But however we account for this original mixing of names, it is easy to perceive how good a start the mixing got; and after reading the text of the old confusion, is it not odd and interesting to trace it down through the years, down through Yancey, to the front hall of the club? to find it cropping up among all sorts and conditions of men, now in a city and now on top of the Wind River Mountains, where it used to perplex me?

And this is only the popular side of it; the scholars have been just as mixed as Yancey. The scientific side of the story is picturesquely seen through the dynasty of Latin names successively lavished upon the goat.

The country at large first heard of the goat in 1806, when Thomas Jefferson accompanied his message to Congress about Lewis and Clark's exploration with various documents, and among these the observations of William Dunbar and Dr. Hunter. Nine years later the eminent George Ord gave to the animal his first academic baptism, and he appeared as *Ovis montana.* Pretty soon M. de Blainville seems to have called him *Antilope americana*, and *Rupicapra americana.* By 1817 he was known as *Mazama Sericea* — which is wandering pretty wide of the family. Four years more, and he is plain Rocky Mountain sheep. Next follow *Capra montana*, *Antilope lanigera*, *Capra Americana*, and *Haplocerus montanus.* This last was beginning to look permanent, when it was discovered that somebody had for some time been styling the goat by a well-devised appellation, to wit, *Oreamnus montanus.* He goes by that now; and it may be doubted if any thief has more

frequently employed an alias than this probably blameless animal. Such is the story of the confusion begun — we can only guess why — by Lewis and Clark, and not cleared up until our own day.

The goat is an animal far less wary than the sheep. His watch is concentrated upon approaches from below. All the hunter has to do is to get above him, to make at once for the summit of the ridge which he proposes to hunt, and the unsuspecting creature will never give you a thought. Upon my word, it is inexcusable to kill him, except for a specimen in a collection; he is so handsome, so harmless, and so stupid! And in his remoter haunts, where the nature of man is still a closed book to him, he "thinketh no evil"; he will stand looking at the hunter with a sedate interest in his large, deep brown eyes. The tenderfoot sportsman, it seems, will generally make his beginnings as a maniac. Suddenly confronted with a herd of wild animals, he frantically pumps his repeating rifle, hypnotized by the glut of destruction. Luckily, he is apt, in his excitement, to miss. His desire is for no one special trophy, but for a hot killing of all in sight. If we are not to blame him for this flare of blind

brute instinct, for heaven's sake don't let us praise the performance! The best that can possibly be said for it is to call it the seamy side of masculinity; and the seamy side of masculinity fits cowardice like a glove. I am speaking from the sinner's bench; and long back in the years (not so long materially, but miles and miles every other way) I see one or two spots of shame. To-day, my wish is to photograph the game, and let him go his way in peace.

With my rifle I carried a kodak among the goats. The kodak and the rifle made a discomfortable pair now and then. For instance: —

"*Saturday twelfth* (November) four and one-half hours' climb up opposite ridge, so as to get above goat seen yesterday. Snow six and eight inches deep on top." This was a day that I carried both instruments, and the rocks continually required the use of both hands. Well, I got the goat that I wanted with my rifle. I took the kodak home with one hundred pictures of my very long, hard, interesting journey. It was the year that the company's films were bad, and I drew one hundred blanks; there was not the semblance of an image upon a single one. The same mischance had attended the Greely expedi-

tion, and I had not travelled as far as they did; so you see my mouth must utter no complaints. No; my mileage fell short of the Greely expedition; but no goat will ever tempt me through such adventures again. Alas, that a man should come to shrink from discomforts which once — but let me tell you about some of them.

Because nothing but good fellowship and kindness were shown me there, I suppress the name of the town at the railroad's end where I waited from Saturday till Monday for the northbound stage. It was Saturday, October ninth, my journal reminds me.

"They gave me a room. . . . I was glad to see as little of it as possible. I washed in the public trough and basin which stood in the office between the saloon and the dining room; and I spent my time either in the saloon watching a game of poker that never ceased, or in wandering about in the world outside. A Chinaman named Madden . . . played poker and of course lost to his American friends, . . . swearing in the most ludicrous jargon. . . . Yet he was good-natured . . . the men seemed to like him . . . at night he returned to the never ending game and lost some more. . . . I went to my room to go

to bed, turned down the bed clothes, and saw there, not what I feared, but cockroaches to the number of several thousand, I should think. They scampered frantically, jostling each other like any other crowd. Then I lifted one pillow and watched more cockroaches hurry under the neighboring pillow for shelter. Then I saw that the walls, ceiling, and floor were all quivering and sparkling with cockroaches. So I told the landlord downstairs. I said that if he had no other room, I would throw my camp blankets on the office table and sleep there if he had no objection. He was sympathetic, and explained that the cockroaches must have come up from the kitchen which was below my room. This was Saturday night, and every Saturday night the cook put powder in the kitchen; so that must have sent them up. This explanation was given me in a voice full of condolence. And I replied that very likely this was how they came and that sleeping in bed with so many at a time would be impossible. He entirely agreed with me. 'Yes,' he said, 'cockroaches is hell.' . . .

"So I unrolled my blankets and the landlord helped me make my bed on his office table, lifting the inkstands and newspapers for me. . . .

I went to sleep, hearing the game of poker in the adjoining room, the gobbling of Madden when he lost, and the hoarse merriment of the other men at his gibberish.

"*Sunday*. . . . This morning the game was still going on, but Madden had retired about four o'clock a loser. The bar-tender, sweeping the office, waked me, and I arose and made a toilet, as usual, in the public trough."

The retrospect fills me with merriment — and regret that it's all over for ever and ever; and the goat does not live for whose sake I would do it again.

It is hard not to yield to further temptation, not to transcribe from that diary of 1892 much more about the appearance and customs of the strange wild country through which I now passed on my way to the goat. Some of the landscape was the worst, the forlornest, the most worthless that I know, far outstripping Nevada in sheer meanness, and as desolate as Arizona, without Arizona's magic splendor and fascination. Great deserts without grandeur, great valleys without charm, great rocks without dignity, mere lonely ugliness everywhere; that is the Big Bend country; and the river Columbia itself, when you finally

descend to it from the parched bare dust and the strewn black boulders of the table-land, is a sweeping, sullen, shadeless flood, the most unlovely river that ever I have seen.

I like, when I can, to bring support to my opinions. On a later day, in the middle of the Big Bend, I came upon a desolate sign-post, placed there no doubt to cheer up the wayfarer's discouraged heart. This post announced that Central Ferry was thirty-five miles distant; and below this a wayfarer had scrawled his personal comment: —

Forty-five miles to water.

And a subsequent wayfarer had added: —

Seventy-five miles to wood.

And a final wayfarer: —

Two and one-half miles to hell.

Ah, the dauntless, invaluable spirit of man! Those few words scrawled by a hand that I should like to shake, made the desert blossom with humor, and I continued on my journey with a smiling heart.

Three nights out from the cockroaches, and I was sleeping in the open, among pleasant hills.

An old ragged fiddler, with hair hanging grizzled to his shoulders, had kept me listening late to all sorts of old-fashioned tunes and dances. He had fiddled his way across our continent, and had taken his lifetime to do so. Here he was, with silvering hair, up in the Cascade Mountains. I spread my blankets a hundred yards from his cabin, where he lived alone. He was perfectly blithe-hearted and perfectly penniless. I don't know his name; I never saw him but that once; I suppose he is dead; but his discourse and his fiddle gave me an evening of entertainment over which I still sometimes dwell. Had I found no goat, the characters that I met, such as he, would have rewarded my excursion. But all things came to me. After some vain trips, whence I returned empty handed from fairly rough camping, on Wednesday, November 2, the diary reads, " One of my particular long-cherished wishes is accomplished, and I have seen and killed a mountain goat." On the next day a second head and hide hung in our very snug camp. These first two were males, and they served as a basis for the description that I have attempted to draw earlier in this chapter. It was while we sat, my companionable guide

and I, skinning the second goat, that we held a conversation which I must here record.

How we ever fell upon such a subject as the royal family of England, I do not remember; but camping in the wilderness uses up subjects, and leaves you with a steadily narrowing choice each day; and T—, who took an illustrated paper, observed to me that he had always rather liked "that chap Lorne." This was how he phrased it; his language about some of the others held less of compliment.

Now I had happened, not long before this, to read of a distressing *contretemps* that had befallen the procession during the Queen's jubilee, and I reminded T— of this; but it was new to him. So I told him that while the crowned heads were proceeding in state through London streets with the eyes of the civilized world watching them with admiration, the Marquis of Lorne's horse kicked up. It was a horse that required a better rider than the Prince of Wales had considered the marquis to be, for he had warned him against the animal beforehand. But the marquis preferred to ride him. And so the horse kicked up, and off fell the marquis, right in the middle of the Queen's jubilee.

T— looked at me and said nothing. I was therefore left uncertain if it came home to the mind of the mountaineer that this royal progress, this historic and panoplied moment, was a bad one for a nobleman to select to tumble off his horse in. I continued: —

"I believe that the Queen, upon seeing the accident, sent somebody."

"Where?" said T—.

"To the marquis. She probably called the nearest King and said, 'Frederick, Lorne's off. Go and see if he's hurt.'"

"'And if he ain't hurt, *hurt* him,'" added T—, speaking for the Queen. So I perceived that he had given the situation its full value.

After this second day of success, storm and snow beat down upon us, a blinding day, keeping us in camp. More storms followed, and no more goat; and we had to shoot a horse which had "cast" himself, being entangled in his rope, and so frozen as he lay helpless overnight in the heavy snow. We left these mountains and departed to others in search of a herd of goat; I wished a female and kid, and we seemed to have lighted upon a resort of old solitary males. Eight days after the second goat we sighted our

herd, and this occasioned an experience more enlightening.

I feel confident that those who have done much hunting of big game have sometimes heard such words as these: "This mountain used to have a bunch of sheep on it all the time; three hundred sheep;" or, "Just about here last season I ran into a band of twelve hundred elk;" or, "I passed two thousand antelope on the flat yesterday." The person who says this to you will have been your own guide, or some visitor to camp who is comparing notes and exchanging anecdotes. I, at any rate, have listened many times to such assertions; and now and then I have been tempted to observe (for instance) in reply: "Two thousand antelope! When you'd counted nineteen hundred and ninety-nine, I should think you'd have been too tired to go on." But these are temptations that I have resisted. I think, too, that the men believed what they said — in a general way. But here with the goat was a famous opportunity. We could see them clearly; they were across a cañon from ourselves, a mile or so away; they were lying down, or standing, some eating, some slowly moving about a little; they were in crowds, and in smaller

groups, and by ones and twos, changing their positions very leisurely; and they seemed numberless; they were up and down the hill everywhere. Getting to them this day was not possible, since most of the day was already gone, and we were high up on an opposite mountain side.

"There's a hundred thousand goat!" exclaimed T—; and I should have gone home asseverating that I had seen at least hundreds.

"Let's count them," said I. We took the glasses and did so. There were thirty-five.

From these thirty-five during the next two days I completed with no trouble, save hard climbing, my tally of desired specimens, — an adult male and female, and a kid, for my own keeping, with two males to give away to friends. And I learned a little more about the goat.

The female is lighter built than the male, and with horns more slender — a trifle. And (to return to the question of diet) we visited the pasture where the herd had been, and found no sign of grass growing, or grass eaten; there was no grass on that mountain. The only edible substance was a moss, tufted, stiff, and dry to the touch. The largest horns at the base measured

six inches in circumference, and twenty-one and a half inches from one tip down to the skull and so across and up to the other tip. I also learned that the goat is safe from predatory animals. With his impenetrable hide and his disemboweling horns, he is left by the wolves and mountain lions respectfully alone. And T— told me of a mother goat's energy. A prospector had in early summer captured a kid still too young to run much. Its mother saw him taking it to camp, ran after him, chased him in full sight of his comrades so hotly that he had to drop her child, and she got it back! I have said by inference, but must definitely state, that the kids are dropped in May and June.

To the sum of our knowledge about the *Oreamnus montanus*, the gift of a subspecies has lately been offered; but acceptance of this gift would at present, I think, be premature. It depends on one's idea of the number of facts needful in daily life to justify a generalization. For instance, if you should read in the paper that one person died of diphtheria last week in New York, it would not prevent your going to that city; but if you read that five hundred had died in a week, you might decide not to take

your children there for the season, — and this would be the result of a justifiable generalization. The rule is nowise different in genuine science. This new variety of goat has been based upon a single specimen, and only the dried skull at that! Because the horns were a few inches longer and spread a few inches wider than the average, and because there were certain differences in measurement of the jaw, is scarce adequate proof that these variations were not a distortion, congenital or the result of accident. We have seen people with squints and with club-feet; we have also been to the circus, yet we do not make subspecies for the Kentucky giant and the bearded lady. But that little ache for self-perpetuation, for some sort of permanence in this forgetting world, throbs in many hearts, and since we are all trying to affix our names to something that will hand them down to the succeeding generations, why not tie them to *Oreamnus* and *Ovis?* And so, reader, you have the pleasing vision of our zoölogists, riding down to posterity upon the backs of sundry subspecies of goat and sheep.

These animals, like all our Western big game, are disappearing. It is not (as the political Western loud-talker has so frequently shouted)

the Eastern "tenderfoot" who is responsible for this destruction; it is the Westerner himself, quietly breaking the laws he made, and killing (to take one recent example) dozens of bull elk out of season in Jackson's Hole, Wyoming, merely to sell the two teeth known as "tushes," and leaving the rest of the carcass to rot on the hills. That is the real man who is destroying our big game, just as he is wiping out our forests. Left in his hands, the face of our continent would presently look like a burnt house. Two years before I hunted the goat, the deer in those mountains came down in herds to stare at the new settlers — who shot them from their cabin doors for fun. The deer are scarce enough now.

The Yellowstone Park is a sanctuary for buffalo, elk, deer, antelope, and sheep. There (if anywhere) our big game have a chance of surviving. I have never heard of goat as existing in this sanctuary; but good news comes lately that the sheep are thriving upon Mt. Evarts. Let me suggest to the commandant that he take steps to secure some goat from the Saw Tooth Range — or anywhere he best can — and try the interesting experiment of breeding the animal in the Yellowstone Park.

ROCKY MOUNTAIN GOAT

(HAPLOCERUS MONTANUS[1])

This is one of the very few mammals that are permanently white or whitish at all seasons, and although commonly termed a goat, it really belongs to the same group as the serows, which it closely resembles in the form and color of the horns. In winter the hair is very long, and pure white in color; along the back it is erect, and much elongated on the withers and haunches, so as to give to the animal the appearance of possessing a pair of humps. The summer coat is comparatively short, and has a yellowish tinge. Height at shoulder just short of 3 feet; weight from 180 to 300 pounds.

Distribution.— North America, throughout the Rocky Mountains, from about latitude 36° in California at least as far north as latitude 60°. By American naturalists the proper generic name of the animal is considered to be *Oreamnus* instead of *Haplocerus.*

[1] "Records of Big Game," Rowland Ward, third edition.

MEASUREMENTS OF HORNS

LENGTH ON FRONT CURVE	CIRCUMFERENCE	TIP TO TIP	LOCALITY	OWNER
−11½	..	..	British Columbia	Clive Phillipps-Wolley
−11	..	..	Kutenay, British Columbia	John T. Fannin (measured by)
−10½	5⅜	..	Montana	Walter James
10¼	5¼	5½	British Columbia	R. Rankin
−10⅛	6½	..	Similkameen River, British Columbia	Arthur Pearse
10⅛	5	6⅛	?	E. N. Buxton
− ♀ 10⅛	4¾	..	British Columbia	Capt. A. Egerton
10	5⅜	6⅜	British Columbia	J. V. Colby
−9¾	5	..	Montana	Theodore Roosevelt
9¾	5½	6¼	N.W. Territories	S. Ratcliff
9¾	5¼	6	N.W. Territories	H.R.H. le Duc d'Orléans
9⅝	5¼	6⅛	N.W. Territories	Sir Edmund G. Loder, Bart.
9½	5½	6¼	Alaska	Sir George Littledale
9½	4½	..	North America	J. D. Cobbold
♀ 9½	4¼	5½	British Columbia	P. B. Vander-Byl
9½	5¼	6⅜	East Kutenay, British Columbia	A. E. Butter
−9½	5¼	6½	Bitter Root Mts., U.S.A.	James J. Harrison
− ♀ 9⅜	4½	5⅝	British Columbia	A. E. Leatham
−9⅜	5⅜	6⅜	British Columbia	T. W. H. Clarke
9¼	5½	5¼	British Columbia	J. Turner-Turner
9¼	5½	..	North America	Earl of Lonsdale
9¼	5½	5¾	British Columbia	G. Lloyd Graeme
9⅛	..	6	Montana	Thomas Bate, British Museum
9⅛	5¼	5	British Columbia	Sir Peter Walker, Bart.
9	4¾	6	British Columbia	T. P. Kempson
−8⅞	5½	4⅜	British Columbia	Count E. Hoyos
8¼	4⅜	5¼	British Columbia	Count Schiebler

INDEX

Age indicated by rings on rams' horns, 208 *n.*
Alaska, buffalo range as extending to, 123.
Fossil remains of musk-oxen found in, 85.
Mountain sheep in, 176, 181 *n.*, 223–224, 226, 246.
Remains of buffaloes found in, 123–124.
Rumors of musk-oxen in, 85–93.
White goat found in, 246, 250, 275.
Alaskan bighorn [*Ovis canadensis dalli*], 176, 181 *n.*, 223–224, 226, 246.
Alces [Moose], 120.
Alleghanies, the, eastern boundary of buffalo range, 120.
Allen, Professor J. A., 79, 80.
Monograph on American bisons by, 119.
Animals, attachment of, to one locality, 138–146.
Antelope, white goat an, 232.
Antelope-hunting on horses, 197.
Antilope americana, white goat termed, 259.
Antilope lanigera, 259.
Arctic islands, musk-oxen on, 51, 60, 85, 93.
Argalis, Asiatic, mountain sheep distinguished from, 223.
Arizona, mountain sheep in, 247.
Arkansas, musk-ox skull found in, 85.
Audubon, J. J., 122, 147.
"Missouri River Journal" quoted, 157–159.
Aurochs, European bison called, 111.
Aylmer Lake, musk-ox killed at, 94.

Babiche, 41, 67.
Bache Peninsula, musk-oxen killed on, 76–79.
Bad Lands, mountain sheep in the, 176.
"Barren Ground of Northern Canada," W. Pike's, 47.
Barren Grounds, hunting in, 17–29.
Physical character of, 34–35.
Route for best reaching, 50–51.
Snowfall in, 35.
Bear River Valley, buffalo formerly abundant in, 125.
Bedson, S. L., experiments in breeding buffalo by, 148.
Bent, George, 128.
Bent, Colonel William, 128.
Berlin, live musk-ox in, 103.
Big Bend country, description of, 264.
Bighorn, American [*Ovis canadensis*], 223–224. *See* Mountain sheep.
Alaskan [*Ovis canadensis dalli*], 176, 181 *n.*, 223–224, 226, 246.
"Biological Survey of Mount Shasta," 250.
Birds, attachment of, to certain localities, 142.

Bison, American [*Bos bison*], 111–166.
Mountain, 126, 135–136.
Points distinguishing, from European bison, 165.
Prairie [*Bos bison typicus*], 165.
Reported relation of musk-ox to, 75.
See Buffaloes.
Bitter Root Mountains, white goat found in, 275.
Blackfeet Indians, white buffalo skin dedicated to Sun by, 127.
Blainville, M. de, 259.
Bodfish, Captain H. H., 93, 103.
Bonneville, Captain, on buffaloes in Bear River Valley, 125.
Bos bison athabascæ [Wood bison], 117, 123, 165.
Bos bison typicus [Prairie bison], 165.
British Columbia, mountain sheep in, 225, 226.
White goat in, 231, 250, 275.
Brown, Arthur, on southern range of white goat, 247.
Brush, absence of, from Barren Grounds, 35–36.
"Buck-fever," 203–207.
Buffaloes, agility of, 135–136.
Attachment to one locality, 140–146.
Battles between males, 131–132.
Bulls, 129–132.
Butchering of, by Indians, described, 157–159.
Calves, 132–135, 146–147.
Color of, 126–128, 132–133.
Cross-breeding of, 147–150.
Description, 165.
Domestication, 147–150.
Extermination of, 111–119.
Habits, 129–130.
Hair, 165.
Height, 165.
Buffaloes [*continued*] —
Herds of, 117, 161–163.
Hides, 130–131.
Horns, 165.
Indians hold sacred, 127–129.
Methods of hunting, 150–156.
Migrations, 137–142.
Panics among, 136–137.
Range, 119–126, 165.
Rubbing-stones, 131, 163.
Rutting season, 131–132.
Superstitions concerning, 127–130.
"Surround" method of hunting, 150–156.
Trails, 138.
Weight, 165.
Young, 132–135, 146–147.
See Bison.
Buffalo-running, 159–161.

California, absence of white goat from, 244–245.
California mountain sheep [*Ovis canadensis nelsoni*], 223, 226.
Calves, buffalo, 132–133, 146–147.
Of musk-oxen, 100, 103, 132–133.
Camping in Barren Grounds, 64–69.
Canoes, musk-ox hunting in, 61–62.
Cape Bryant, musk-oxen killed at, 93.
Capote, caribou-skin, 55.
Capra americana, white goat called, 259.
Capra montana, 259.
Caribou, course of migration, in Barren Grounds, 44, 47–48.
Cervus canadensis [Elk], 120.
Chamois, relation of white goat to, 232.
Charging, false reputation of musk-oxen for, 73–75.

Cheyenne Indians, white buffalo skins dedicated to Sun by, 127.
Coffee a luxury in the North, 50.
Cogmolik Indians, 92.
Colorado, buffalo-horns from, 166.
Colorado Cañon, mountain sheep in, 247.
Copenhagen, live musk-ox in, 105.
Corsica, the moufflon of, 182.
Coues, Dr. Elliott, 256.

Dakota, disappearance of mountain sheep from, 178–179.
Deer-hunting on horses, 197.
District of Columbia, buffaloes reported as once found in, 120–121.
Dodge, Colonel, 115, 133, 161.
Dogs, question of shipping, into the Barren Grounds, 41–42.
Scarcity of, in North Country, 38–39.
See Sledge-dogs.
Domestication of buffaloes, 147–150.
Drought, buffaloes driven from Mississippi by, 121.
Duffel, the, defined, 39.
Duke of Bedford, live musk-ox owned by, 103.
Dunbar, William, 257, 259.
Dung of musk-ox, 100.

Earl of Lonsdale, musk-ox horns owned by, 99–100.
Elk [*Cervus canadensis*], 120.
Slaughter of, at Jackson's Hole, Ky., 273.
Elk-hunting on horses, 197.
Equipment for Barren Ground expedition, 53–54.
Europe, fossil remains of musk-oxen found in, 85.
Specimens (live) of musk-ox in, 103.

Ewe and lamb, Wister's experience with, 210–222.

Feeding, problem of, in Barren Grounds, 41–42.
Firth, John, 91.
Flesh of musk-oxen, 100–103.
Flowers in the Barren Grounds, 62.
Fort Resolution, 39, 50.
Fossil remains of musk-oxen, 85.
Franz Josef Land, musk-oxen unknown in, 93.
Fremont, J. C., on western range of buffaloes, 125.
Fur, color of, of musk-oxen, 80, 104.

Gass, 175, 179, 256.
Gaudet, Hudson's Bay Company post factor, 53.
Goat, relation between sheep and, 182. *See* White goat.
Grease, craving for, in the North, 47.
Great Lakes northern boundary of buffalo range, 121.
Greenland, musk-oxen in, 51, 79–80, 85.
Green River, buffaloes found on tributaries of, 125.
Grinnell Land, fossil remains of musk-oxen in, 85.
Musk-oxen of, 79–80.

Haggerty, Captain, 90.
Hair of white goat, 239, 240–241, 257.
Haplocerus montanus [Rocky Mountain goat], 231, 259, 274. *See* White goat.
Harlan's musk-ox [*Ovibos bombifrons*], 76, 85.
Headgear in Barren Ground hunting, 33–34.
Heads of musk-oxen, 99–100.

Henry, Alexander, Journal of, 118, 161–162.
Hides, of buffaloes, 130–131.
White goat, 241.
Hodgson, Mr., Hudson's Bay Company trader, 91.
Hoofs of white goat, 239–240.
Hornaday, W. T., 120–121, 148, 165.
Horns, of mountain sheep, 181 *n.*
Musk-oxen's, 76, 98–100.
Rings on rams', 208 *n.*
White goat's, 239.
Horses, antelope-hunting on, 197.
Buffalo-hunting on, 153–155.
Deer-hunting on, 197.
Sheep-hunting on, 192–193.
Hostility between sheep and goat, 233–237, 245–246.
Hudson's Bay Company posts, 37.
Hunter, Dr., 257, 259.
Hunting seasons in Barren Grounds, 44–48, 50–52.

Idaho, white goat in, 247, 250.
India, sheep found in, 182.
Indians, Alaskan, 90, 91, 92.
For Barren Ground hunting, 52–53.
Buffaloes formerly sacred to, 127.
Methods of, in hunting musk-oxen, 47–49.
Slaughter of buffalo by, 157–159.
Innuits, musk-ox hunting by, 60–61.

Jackson's Hole, elk-killing at, 273.
Jones, C. J., experiments in breeding buffalo by, 148.

Kamchatka, sheep found in, 182.
Kentucky, buffaloes formerly in, 122.
Domestication of buffaloes in, 147.
Skull of musk-ox found in, 85.
Kids of white goat, 271.
Knife for musk-ox hunting, 67.
Kodak, hunting with a, 261.
Kogmolik Indians, 92.
Kookpugmioot Indians, 92.

Lambs of mountain sheep, 208–222.
"Land of Little Sticks," 17, 36.
Laramie Plains, buffaloes on the, 124, 125.
Lewis, Meriwether, 175–176, 245, 255–257.
Confusion of goat and sheep by, 251, 255–260.
Livingston, Mont., mountain sheep seen at, 171–173, 183–184.
London, live musk-ox in, 103.
Loucheaux Indians, 91.
Lydekker, Professor R., 75, 79.
"The Royal Natural History" of, 246.

Mackenzie River, musk-oxen not found west of, 86–93.
Maclaine of Lochbuie, the, horns of sheep owned by, 224.
Maps, mistakes in, 244–245.
Mazama Sericea, white goat named, 259.
Mexico, mountain sheep in, 181 *n.*, 247.
Migrations, buffalo, 137–142.
Caribou, in Barren Grounds, 44, 47–48.
Mississippi, buffaloes formerly in, 121.
"Missouri River Journal," Audubon's, quoted, 157–159.
Moccasins essential in Barren Ground outfit, 39.
Montana, bison horns from, 166.
Mountain sheep in, 225, 226.
White goat in, 250, 275.
Moore, Francis, "Voyage to Georgia" of, 121.

Moose [*Alces*], 120.
Mosquitoes in Barren Grounds, 44.
Moufflon, the, of Corsica, 182.
Mt. Evarts, sheep on, 273.
Mountain bison, 126, 135–136.
Mountain sheep [American bighorn, *Ovis canadensis*], 171–226.
Color, 179–180.
Description, 179–183, 223–224.
Distribution, 176, 224.
Habitat, 199, 246–247.
Height, 224.
Hide, 179.
Horns, 223–225.
Hostility to goat, 233–237, 245–246.
Keenness of sight, 219.
Lambs, 208–222.
Method of hunting, 197–199.
Range, 176, 224.
Rutting season, 184, 208.
Species and subdivisions, 180–182.
Weight, 224.
White goat and, 233–237, 245–246.
White variety [*Ovis dalli*], 181, 201.
Munn, Henry Toke, 47.
Musk-ox of Barren Grounds [*Ovibos moschatus*], 17–106.
Action when attacked, 59–60, 73–75.
Appearance, 73.
Calves, 100, 103, 130–131.
Dung of, 100.
Flesh, 100, 103.
Fur, 97–98, 104–105.
Genus, 75–80.
Herds of, 97.
Hides not valuable, 52.
Horns, 98–100, 104, 106.
Inaccessibility of, 50.
Musk-ox [*continued*] —
Method of hunting, 56–69.
Origin (reputed), 70.
Permit necessary for hunting, 51.
Range, 76, 79–80, 85–94, 105.
Size, 94, 105.
Specimens (live), 103.
National Park, Colorado, buffaloes in, 117–118. *See* Yellowstone Park.
Noonitagmiott Indians, 90.
North Platte River, buffaloes on tributaries of, 126.
Olympic Range, white goat not found in, 250.
Ord, George, 259.
Oreamnus montanus [Rocky Mountain goat], 231, 259, 274.
Oregon, absence of white goat from, 250.
Ovibos bombifrons [Harlan's musk-ox], 76, 85.
Ovibos moschatus [Barren Ground and Greenland type of musk-ox], 76, 80, 82, 83, 104–105.
Ovibos pearyi, 80.
Ovibos wardi, 76, 77, 79, 80, 82, 83, 104–105, 106.
Ovis canadensis [American bighorn], 180–181, 208, 223–224. *See* Mountain sheep.
Ovis canadensis auduboni, 181.
Ovis canadensis dalli [Alaskan bighorn], 176, 181 *n.*, 223–224, 226, 246.
Ovis canadensis nelsoni [Californian sheep], 223, 224.
Ovis canadensis stonei, 223.
Ovis canadensis typica [Rocky Mountain sheep], 223, 259.

Ovis cervina, 181.
Ovis dalli, 181, 201.
Ovis fannini [Saddleback sheep], 181–182, 213.
Ovis mexicana, 181.
Ovis montana, 259.
Ovis nelsoni, 181, 187.
Ovis stonei, 177, 181.

Panics among buffaloes, 136–137.
Pawnee Indians, buffalo skins sacred to, 127.
Peary, Lieutenant, musk-ox captured by, 105.
Musk-oxen killed by, 76–79, 93.
Pemmican, from dried buffalo meat, 156.
Scarcity of, in the North, 49.
Philadelphia, white goat in Zoölogical Gardens at, 231, 237–238.
Piccolo, Padre, 250.
Pike, Warburton, 47, 62, 74, 94.
Musk-ox heads owned by, 100.
Pine, patches of, in Land of Little Sticks, 36.
Platte River, buffaloes on tributaries of, 125–126.
Prairie bison (*Bos bison typicus*), 165.
Protection, government, of musk-oxen, 51.
Provision question in musk-ox hunting, 36–38.
Provisions in Barren Grounds, 62–63.

Rae, J., Hudson's Bay Company factor, 99.
Railroads, effect of, on buffaloes, 113–116.
Ram seen at Livingston, Mont., 171–173, 183–184.
"Records of Big Game," R. Ward's, 104, 165, 223–224, 274.
Red Desert Country, buffaloes in, 126.
Red River, buffaloes on the, 162.
Red River half-breeds, buffalo hunts of, 117, 154–155.
Rings on rams' horns, 208 *n.*
Robinson, John ("Uncle Jack Robinson"), 124.
Rocky Mountain goat [*Haplocerus montanus* or *Oreamnus montanus*], 231, 259, 274.
See White goat.
Rocky Mountain sheep [*Ovis canadensis typica*], 223, 259.
"Royal Natural History, The," Lydekker's, 246, 247.
Rubbing-stones, buffaloes', 131, 163.
Rupicapra americana, white goat termed, 259.
Rutting season, buffaloes', 131–132.
Mountain sheep's, 184, 208.

Saddleback sheep [*Ovis fannini*], 181–182, 213.
Salt Lake Valley, buffaloes in, 124.
Salvatierra, Padre de, 250.
Saw Tooth Range, white goat in, 247.
Schwatka, Frederick, 60, 61, 93.
Serows, Rocky Mountain goat member of same group as, 274.
Sheep. *See* Mountain sheep.
Shoshone Indians, sheep-hunting on horses by, 193.
Siberia, fossil remains of musk-oxen found in, 85.
Skulls of musk-oxen, 75–76, 80, 82, 83.
Slaughter of buffaloes in America, 114–119.
Sledge, description of, in Barren Ground outfit, 40–41.
Sledge-dogs, methods of harnessing, 60–61.
Scarcity of, in North, 38–39.
Snowfall in Barren Grounds, 35.

Snows, effect on buffaloes, 124, 137.
Snow-shoes, Barren Ground, 35.
Spitzbergen, musk-oxen unknown in, 93.
Stone, Andrew J., report as to western range of musk-oxen, 86–93.
Stouch, Major G. W. H., 143.
Stringer, Rev. I. O., 89, 90.
Strouds, 53, 54.
"Surround" method of hunting buffalo, 150–153.
Sweetwater River, buffaloes on, 126.

Tail, lack of, in mountain sheep, 182.
Tea an essential in Barren Ground outfit, 39–40.
Tennessee River southern boundary of buffalo range, 121.
Tepee in Barren Ground outfit, 55, 57, 64.
Teton Range, sheep-hunting in, 209–222.
Tibet, sheep found in, 182.
White goat in, 239.
Tobacco, necessity of, in Barren Ground outfit, 39–40.
Tooyogmioot Indians, 90.
Tracks made by white goat, 239–240.
Travelling, methods of, in Barren Ground hunting, 62–63.
Trees, absence of, from Barren Grounds, 35–36.
"Tripping" snow-shoes, 35.

Vaches (*vaches sauvages*), 120.
Virginia, domestication of buffaloes in, 147.
"Voyage to Georgia," Moore's, 121.

Ward, Rowland, 79.
"Records of Big Game" by, cited, 104, 165, 223, 274.
Washakie Needle, mountain sheep on the, 186–196.
Washington (state), white goat found in, 250.
White goat [*Oreamnus montanus*], 227–273.
Color, 242–243, 274.
Description, 239–242.
Food, 249.
Habitat, 231, 245–251.
Hair, 257.
Height, 274.
Hide, 241.
Horns, 258.
Hostility to sheep, 233–237, 245–246.
Immigration from Asia, 232–233, 245–246.
Kids, 271.
Lewis's error about, 251, 255–260.
Method of hunting, 260.
Origin, 232–233.
Relationship to chamois, 232.
Sheep and, 233–237, 245–246.
Size, 242.
Species, 232, 259.
Specimens (live), 231, 237–238.
Track made by, 239–240.
Various Latin names for, 259.
Weight, 241, 274.
Whitney, Casper, musk-ox head taken by, 100.
Whitney, William C., live musk-ox bought by, 103.
Wild cows, elk called, 120.
Wood bison [*Bos bison athabascæ*], 117, 123, 165.
Wool of musk-ox, 97–98, 104–105.
Wycliff, Robert, 147, 148, 149.
Wyoming, bison horns from, 166.
Mountain sheep in, 185, 225, 226.
White goat not found in, 245, 248.

Yancey, John, 252.
Yellowstone Park, bison horns from, 166.
  Buffaloes in, 117–118.
  Game in, 273.
Yoke, breaking buffaloes to the, 149.
Young, of buffaloes, 132–135, 146–147.
  Of mountain sheep, 208–222.
Young [*continued*] —
  Of musk-oxen, 100, 103.
  Of white goat, 271.

Zoölogical gardens, musk-oxen in, 103.
Zoölogical Gardens, Philadelphia, white goat in, 231, 237–238.

AMERICAN SPORTSMAN'S LIBRARY

Edited by CASPAR WHITNEY

Crown 8vo. Cloth. Each $2.00 net

The Deer Family

By THEODORE ROOSEVELT, T. S. VAN DYKE, D. G. ELLIOT, and A. J. STONE. Illustrated by CARL RUNGIUS; with map by Dr. C. HART MERRIAM.

"The illustrations by Carl Rungius are excellent and appropriate, and the entire contents of the book bear evidence of having been written by men who have a loving and educated interest in their subjects."

— *New York Evening Post.*

Upland Game Birds

By EDWYN SANDYS and T. S. VAN DYKE. Illustrated by L. A. FUERTES, A. B. FROST, J. O. NUGENT, and C. L. BULL.

"It is a creditable work, written with care and intelligence, and will be found very entertaining by those who pursue feathered game. There is a good deal of instruction to be found in the work, which is likely to add considerably to the success of the sportsman when hunting the birds described."

— *Shooting and Fishing.*

Salmon and Trout

By DEAN SAGE, W. C. HARRIS, and C. H. TOWNSEND. Illustrated by A. B. FROST and others.

"A distinctly valuable and authoritative contribution. . . . Will be found to contain interesting material and reliable information for the enthusiastic fisherman, who would know how, when, and where to fish for these gamy denizens of our lakes and streams."

— *The Fishing Gazette.*

THE MACMILLAN COMPANY

66 FIFTH AVENUE, NEW YORK

AMERICAN SPORTSMAN'S LIBRARY

The Water-fowl Family

By LEONARD C. SANFORD, L. B. BISHOP, and T. S. VAN DYKE. Illustrated by L. A. FUERTES, A. B. FROST, and C. L. BULL. *Now ready.* Price $2.00 net.

Bass, Pike, Perch, and Pickerel

By JAMES A. HENSHALL, M.D. Illustrated by MARTIN JUSTICE and others. *Now ready.* Price $2.00 net.

Big Game Fishes of the United States

By CHARLES F. HOLDER. Illustrated by CHARLES F. W. MIELATZ and others. *Now ready.* Price $2.00 net.

The Sporting Dog

By JOSEPH A. GRAHAM, with many illustrations. *Now ready.* Price $2.00 net.

Musk-ox, Bison, Sheep, and Goat

By CASPAR WHITNEY, GEORGE BIRD GRINNELL, and OWEN WISTER. Illustrated by CARL RUNGIUS and others. *Now ready.* Price $2.00 net.

IN PREPARATION FOR EARLY ISSUE

Guns, Ammunition, and Tackle

By A. W. MONEY, W. E. CARLIN, A. L. A. HIMMELWRIGHT, and J. HARRINGTON KEENE. Illustrated.

Photography for the Sportsman Naturalist

By W. E. CARLIN. Illustrated.

Further volumes will include articles on The Bear Family; The Cougar, Wild Cat, Wolf, and Fox; American Race Horse and Running Horse; Trotting and Pacing; Riding and Driving; Yachting, Small Boat Sailing, and Canoeing; Baseball and Football; Rowing, Track Athletics, and Swimming; Lacrosse, Lawn Tennis, Wrestling, Racquets, Squash, and Court Tennis; Skating, Hockey, Ice Yachting, Coasting, and Skate Sailing.

THE MACMILLAN COMPANY

66 FIFTH AVENUE, NEW YORK

2 00

UC SOUTHERN REGIONAL LIBRARY FACILITY

A 000 541 946 0

Date Due

JUN 7 1963			
APR 26 1963			
JAN 5 1966			
JAN 7 1966 7			
JUL 28 '66			
JUL 26 1966			

Y

AND

STATION

Library Bureau Cat. No. 1137